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pertenui, color columbæ; spirâ subobtusâ; anfractibus quinis, convexiusculis, ultimo pergrandi; aperturâ magnâ, latè ellipticâ; labro regulariter expanso, subtèr marginem parùm incrassato et crocato; columellâ medio impressâ, parùm incrassatâ et plicâ indutâ.

Hab.—Salt Lagoon, near Monterey, California, J. B. Trask, M. D.

PHYSA BLANDII.—Testâ ovato-subfusiformi, subobliquâ, inflatâ, dilutè stramineâ vel albidâ; spirâ obtusâ; suturis impressis; anfractibus quaternis, ultimo inflato et pergrandi; aperturâ ovatâ, subgrandi; labro expanso, subtèr marginem incrassato et pallido crocato; columellâ incrassatâ, impressâ, plicatâ et contortâ.

Hab.—California, Mr. Thomas Bland.

PHYSA NUTTALLII.—Testâ inflatâ, subdiaphanâ, parùm nitidâ albidâ; spirâ obtusâ, curtâ; suturis impressis; anfractibus quaternis, convexis, ultimo pergrandi et inflato; aperturâ grandi, subrotundâ, subtèr marginem pallidofuscâ; labro acuto, valdè expanso; columellâ leviter incrassatâ, et contortâ.

Hab.—Lewis' River, Oregon, Prof. Thomas Nuttall.

PHYSA VENUSTA.—Testâ subcylindraceâ, tenuissimâ, diaphanâ, nitidâ, albâ; spirâ curtâ, acuminatâ; suturis leviter impressis; anfractibus quaternis, convexiusculis, ultimo pergrandi; aperturâ magnâ, elongato-ovatâ, subtèr marginem fuscâ; labro acuto et sinuoso, vix expanso; columellâ parum impressâ.

Hab.—Near Fort Vancouver, Oregon, Sir George Simpson.

PHYSA HORDACEA.—Testâ subcylindraceâ, pellucidâ, politâ; dilutè rufâ; spirâ subelevatâ subacutâ; suturis subimpressis; anfractibus quinis, ultimo grandi et constricto; labro acuto, margine rufo lineato; aperturâ ovatâ, supernè acutè angulatâ; columellâ aliquantò impressâ et incrassatâ.

Hab.—Vancouver Island, Oregon, Sir George Simpson.

PHYSA BREVISPIRA.—Testâ lævi, lato-ellipticâ, albidâ, diaphanâ, inflatâ; spirâ brevissimâ, obtusâ, vix exsertâ; anfractibus ternis, ultimo grandi et inflato; labro acuto, margine intus incrassato; aperturâ pergrandi et dilatâtâ; columellâ incrassatâ, impressâ et contortâ.

Hab.—Ottawa River, Canada West, E. Billings, Esq.

A Critical Review of the Family PROCELLARIIDÆ:—Part II.; Embracing the PUFFINIDÆ.

BY ELLIOTT COUES, M. D.; U. S. A.

The present paper is the second of a series in which it is proposed to consider the entire family of Petrels. The first fasciculus in which the Procellariidæ or "Stormy Petrels" are reviewed, has already appeared in these Proceedings; in the present continuation of the subject are embraced the Puffinidæ, or "Shearwaters."

In writing upon the Procellariidæ I had regard more particularly to the generic disposition of the species; for most of them were so well known as to require comparatively little comment upon their specific distinctions. With the Puffinidæ, however, the case is exactly the reverse. While the generic groups are very plainly indicated, the species comprised in each are for the most part quite numerous, and their relations to each other, generally so very intimate, as regards size, form, and color, that it requires careful and discriminating comparison to separate them. I have, therefore, given this part of the subject in hand special attention; and have gone considerably into details in my examination of the specific characters and relationships of the numerous components of the group, believing that in no other way can the desirable degree of information on the subject be attained. At

[April,

the same time the many intricate questions of synonymy involved have necessitated somewhat lengthy discussions.

In my arrangement of the genera and species I have closely followed that given by Bonaparte in his *Conspectus*; except that I place among the Puffinæ the genus *Adamastor*; which Bonaparte considers as belonging to the Fulmaræ. The position of this genus is, indeed, a little uncertain, the characters of the bill approximating to those of the Fulmaræ. Its bill, however, is almost identical with that of *Majaqueus*; and it agrees so closely in other respects that the two genera cannot be placed in different groups; while the possession by each of twelve, instead of fourteen or sixteen rectrices, plainly indicates that they belong to the Puffinæ rather than to the Fulmaræ.

The Puffinæ, as I regard them, are composed of five genera, viz.:—*Majaqueus*, *Adamastor*, *Thiellus*, *Nectris* and *Puffinus*. The two first of these are very different from the three last in many respects; and warrant a subdivision of the section into two groups. The first, or the "*Fulmar-Puffins*," have the bill stouter than ordinary; the nasal tubes longer, more elevated, more decidedly tubular, vertically truncated at their apices, and the nasal septum thinner; the wings and tail shorter. The three latter of the above-named genera constitute the "*Puffins* proper." The bill is very long and slender; the nasal tubes short, broad, depressed, obliquely truncated; the nasal septum thick; the wings and tail very long, the latter much rounded; and the feet very large. As for the genera themselves, they are hardly worth retaining, except it be for convenience' sake. *Thiellus* is merely *Nectris* with a longer and more decidedly cuneiform tail; while *Nectris* hardly differs from *Puffinus*, except in its rather slenderer bill, and entirely fuliginous color. The subdivision of *Puffinus* into "*Ardenna*," "*Prifinus*," and "*Puffinus*" seems quite unwarrantable.

I shall consider the species of the five genera in the order in which they are named above, and conclude with a brief synopsis of the section in accordance with the results arrived at in the investigation.

MAJAEQUEUS, Reich.

Gen. char.—Bill a little shorter than the head, about equal to the tarsus, stout, compressed, higher than broad at the base, the culmen rising immediately from the nostrils, the unguis large, very convex, much hooked. Com-missure unusually curved from feathers to unguis, the concavity looking upwards; outline of inferior mandibular rami quite straight to the unguis. Nasal tubes long, (nearly a third the length of the culmen), elevated, laterally obliquely flattened, carinated along the median line, apically vertically truncated, with a considerable emargination; nostrils quite circular; the septum narrow for this section. Wings very short for this family. Tail also exceedingly short, and subtruncated, the graduation of the lateral feathers being slight. Feet stout, the tarsus greatly abbreviated, being much shorter than the middle toe without its claw. Outer toe without claw longer than the middle. Tip of the inner claw reaching the base of the middle one. Of large size, dark color, and exceeding robust form.

The preceding paragraph characterizes a marked and very peculiar genus of Procellariidæ. It is at once distinguished from all its allies by the combination of the large size, extreme robustness of bill and feet, as well of the whole body, the unusually short wings and tail, the dark colors, etc. It is most nearly allied to *Adamastor*, the bills of the types of the two genera being almost identical; but other characters readily distinguish the two.

Two species of this genus are recognized by ornithologists. Dr. Schlegel has well shown that it is rather by peculiarities of form and size that *conspicillatus* is to be distinguished, if at all, from *aequinoctialis*.

1864.]

MAJAEQUEUS AEQUINOCTIALIS, Reich ex Linn.

Procellaria aequinoctialis, Linn., S.N., ed. vi. (1758), Id. ed. xii, i., 1766, p. 213. Gmel. S. N. i., p. 564. Lath. Ind. Orn. ii., 1790, p. 821, et auctorum. *P. aequinoctialis*, Vieillot, Nouv. Dict. d' H. N., 1817, xxv., p. 422. *Profinus aequinoctialis*, Hombr., et Jacquin. *Majaequeus aequinoctialis*, Reich, Syst. Av., pl. 20, fig. 340, 341. Bonaparte, Consp. Avium, ii. 1856, p. 200.

Puffinus capitis Bonae-spei, Brisson, Ornith. vi. 1760, p. 137. *Procellaria nigra*, Forster, Deser. Anim, ed. Licht. 1844, p. 26. "*Procellaria fuliginosa*, Solander."

Habitat.—"In oceano Australi extra tropicum, (nunquam visa ad lineam aequinoctialem, unde patet, in ipsum nomen '*aequinoctialis*' non quadrare." (FORSTER).

It is unnecessary to give any description of this long and well known species.

The white spots on the throat and cheeks appear to vary much with age. In the perfectly adult bird the triangular gular spot is alone left; that on the cheeks, which is connected with it in immature birds, having disappeared. Very young birds have the under parts almost wholly whitish, which afterwards deepens into fuliginous.

The present is one of the three species of *Procellariæ*, (*pelagica*, *aequinoctialis*, *capensis*), known to Linnæus in 1758, and given in the sixth edition of his *Systema Naturæ*. The name *aequinoctialis* appears, according to the observations of most naturalists, to be geographically erroneous; and probably on this account it was changed to *nigra* by Forster in 1772. But as it is impossible to say exactly what are the limits of a *Procellaridian's* wanderings, it would be hardly warrantable, I think, to change Linnæus' appellation.

There are no points of synonymy which require discussion here.

MAJAEQUEUS CONSPICILLATUS, Bp. ex Gould.

Procellaria conspicillata, Gould, Ann. et Mag. N. H., 1844, lma. series xiii., p. 362. Id. Birds Austr. vii. pl. 46. Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 20. *Majaequeus conspicillatus*, Bonap. Consp. Av. ii., 1856, p. 200.

Procellaria larvata, Lesson.

Habitat.—Australian Seas.

This species, despite the peculiar markings of the head, which usually characterize it, is, nevertheless, exceedingly closely allied to the preceding. Examination of the large series in the Philadelphia Academy collection shows the markings to be very variable as to their extent, and that they are sometimes hardly traceable at all. (Consult on this point Dr. Schlegel's monograph, where the point is fully elucidated.) In the majority of specimens the submental white patch is more or less perfectly connected with a broad white stripe, which, passing from the feathers on the side of the lower mandible, runs backwards on the side of the head, below the eye, curving upwards on the occiput, so as nearly to meet its fellow of the opposite side. In addition to this, a broad somewhat crescentic patch occupies the anterior portion of the vertex, and descends on the cheeks in front of the eyes nearly or quite to the commissure of the bill, leaving the features of the extreme front black. The colors in every other respect are those of *aequinoctialis*.

More constant and reliable, though not so conspicuous, diagnostic features are to be found in other characters. The bird is larger than *aequinoctialis*; its bill is a little longer and considerably more robust, and has the unguis of both mandibles bluish black instead of bright yellow. The sides of the mandibles are also usually much darker in color. The wings and tail, on an average, exceed those of *aequinoctialis* by an inch or so, but the variation with individuals of both species amounts to more than this. A corresponding relative difference exists in the average length of the tarsus and toes.

[April,

There are no points of synonymy connected with this species which require notice.

ADAMASTOR, Bon.

Char. Gen.—Of large size and robust form. Bill a little shorter than the head, about three-fourths the tarsus, broad and stout at the base, narrowing regularly to the strong, very convex compressed unguis. Nasal tubes longer than ordinary (for the Puffinæ) very broad, depressed, but vertically truncated at their extremity, and with an unusually thin septum, somewhat as in the Fulmaræ, to which the genus bears considerable analogy. Wings rather short for this section; the primaries broad and stout, the second quite as long as the first. Tail rather short, of twelve feathers; the central rectrices projecting and a little acuminate; the lateral more rounded, and rapidly graduated. Feet of the usual size, moderately compressed and stout. Tarsus shorter than the middle toe without its claw. Outer toe longer than the middle. Tip of outer claw about reaching base of middle.

The genus *Adamastor* was founded in 1856 by Bonaparte to accommodate certain Procellariids, which seem to combine in a remarkable manner the characteristics of both the Fulmaræ and the Puffinæ. The species resemble most the Fulmaræ in the length, vertical truncation and thin septum of the nasal tubes; and also less markedly in the shape of the wings and tail. In all other respects they are, however, true Puffinæ. The bill, in shape and comparative size, can hardly be distinguished from that of *Majaques acuinotialis*, which is one of the Puffinæ. The most essential character of the bill of the Fulmaræ is that the outline of the unguis of the lower mandible is about straight and ascending; that of the Puffinæ is very concave and decurved. *Adamastor* possesses the latter character. Again, the tail of the Fulmaræ has fourteen (*Fulmarus*) or sixteen (*ossifraga*) rectrices; the tail of *Adamastor* but twelve. The large stout feet, too, are those of Shearwaters, and not of Fulmars. From these manifold considerations I think that it is manifest that the proper affinities of the somewhat anomalous genus are decidedly with the Puffinæ, rather than with the Fulmaræ, among which Bonaparte has located it.

It is not a little surprising that so great confusion and uncertainty should have reigned concerning so marked a species as *P. cinereus*, Gmel, the type of this peculiar genus. On my remarks, infra, upon *A. cinereus*, and also upon *Puffinus Kuhlîi*, I hope I have elucidated several vexed questions of synonymy satisfactorily.

Three species are known to me to compose this genus.

ADAMASTOR CINEREUS Coues ex Gmel.

Procellaria cinerea, Gmelin, Syst. Nat., I. pars 2, 1788, p. 563. Latham, Ind. Ornith., ii. 1790, p. 824. Vieillot, Nouv. Dict. d'H. N., 1817, xxv. p. 418. Sed non *Proc.* vel *Puff.* vel *Nectr. cinereus*, Kuhl, Cuv., Temm., Degl., Keys. et Blas. Schinz., Schleg. nec al auct. Europ. recent. fere omnium, quæ *P. Kuhlîi*, Boie: nec Audubon, et auct. Americ. quæ *P. major* Faber.

Puffinus cinereus, (Gm.) Lawrence, Birds N. A., 1858, p. 835; ex Californiâ. (Homonyma accuratè enumerata; descriptio præstans; et observationes pertinentes.)

Procellaria hesitata, Forster, Descript. Anim., ed. Licht., 1844, p. 208. Gould, Birds Austr., vii. pl. lxxvii. et Reichenbach, Syst. Av., pl. xxiv. fig. 2604; nec Kuhl, Beit. Zool., p. 142; nec Temm., Pl. color tab. 416; quæ species *Astrelata* generis, teste Bonaparteo. *Puffinus hesitatus*, Lawrence, Ann. New York Lyc. Nat. Hist., 1853, vi. p. 5.

Adamastor typus, Bonaparte, Consp. Avium, ii. 1856, p. 187. Comptes Rendus Ac. Sc. Tab. Longip.—*Procellaria adamastor*, Schlegel, Monog. Proc. Mus. Pays-Bas, 1863, p. 25.

1864.]

Puffinus Kuhlii, Cassin, Proc. Acad. Nat. Sci. Philada., June, 1862, p. —
(Specimena ipsa a me visa.) Sed non Boie, nec auct.

?*Procellaria melanura*, Bonn, Encyc. Method.

Description.—Form typically that of the genus, which see, *suprà*.

Color.—The nasal tubes, and culmen as far as the unguis, are black; the unguis is pale yellowish. The sides of the upper mandible, as far as the sulcus which separates them from the culmen, yellow, as are the sides of the lower mandible and its unguis; the sulcus of the lower mandible and its commissural edge being bluish black. [Compare FORST. Descr., p. 208.] Feet in the dried specimen dingy bluish or yellowish green, dusky exteriorly and posteriorly, the webs yellow, the claws light brown, with black tips. Above a uniform cinereous, of much the same shade over the whole upper parts; some of the feathers, especially the scapulars and tertials, with just appreciably lighter tips; the crown of the head and the circumocular region a little deeper cinereous than elsewhere. The wing coverts of the specimen in question are interspersed with feathers of a dull brownish rather than cinereous hue. These are evidently old worn ones, and doubtless indicate that in this species, as in others, the newer and fresher the feathers the clearer and more decided is the *cinereous* hue. The color of the upper parts has no line of demarcation with the white of the lower on the sides of the head and neck. Insensibly fading away, it extends quite around on the chin and throat, but is more restricted on the sides of the neck. The primaries are blackish cinereous on their outer webs and at their tips; light greyish cinereous internally and basally; their shafts are light brown. The inferior surfaces of the wings, together with the axillary feathers and some feathers on the sides of the body under the wings, are dull brownish cinereous. The tail feathers and the entire under tail coverts, from the anus backwards, are deep blackish or sooty cinereous, the rectrices the darkest. The rest of the under parts are white.

Dimensions.—Length about 19 inches. Bill along culmen 1.80; from feathers on side of lower mandible to its apex 1.50; height of bill at base .65; width of bill at base .60. Wing from the carpus 13.00; tail 5.75; exterior rectrices 1.25 shorter. Tarsus 2.40; middle toe and claw 2.90; outer do. 3.00; inner do. 2.50. Length of nasal tubes .45, inches and hundredths.

Bibliography.—As I have endeavored to prove, in my discussion of the synonyms of *P. Kuhlii* (which see), the *Proc. cinerea*, Gmelin, is really the present species, and not the common Atlantic bird to which the name *cinereus* has been generally applied by European authors. Bonaparte, indeed, was completely convinced of this; and it is the more singular that he does not adopt Gmelin's name, but prefers to confer a new specific designation,—viz.: *typus*, in direct violation of one of the most firmly established laws of nomenclature. To Mr. G. N. Lawrence is due the credit of restoring Gmelin's name to the species to which it rightfully belongs.

The *Proc. hesitata* of Forster is most undoubtedly, I think, the present species. His description is pertinent in every respect; and his remarks concerning the form and color of the bill will apply to no other species. The *hesitata* of Gould's Birds of Australia, and of Lawrence, (Ann. New York Lyc. Nat. Hist.,) is the same bird. The *hesitata* of Kuhl's Monograph and of Temminck's Planches Colorées is apparently, however, not this species, but the *Astelata diabolica*, Bp. ex L'Herm.

I quote "*P. melanura*, Bonn." on authority of Bonaparte, not having an opportunity of verifying the reference.

* The accompanying description was taken from a fully mature specimen from the coast of California, of Monterey, kindly furnished for examination by Mr. Lawrence. It is the example from which Mr. Lawrence's description of *P. hesitata*, in the *Annals of the New York Lyceum*, and of *P. cinereus*, in the *Birds of North America*, was taken; is not incompatible in any feature with *P. cinereus*, Gm., Lath. Vieill.; agrees entirely with Forster's *P. hesitata*, with Bonaparte's *Adamastor typus* and Schlegel's *Proc. adamastor*.

The following resumé of the points under discussion is given for convenience of reference:

Proc. cinerea, Gm., Lath., Vieill. (1817); (nec auct. Europ. quæ *P. Kuhlî*, Boie; nec auct. Amer. quæ *P. major*, Faber) = *Puffinus cinereus*, Lawrence, 1858 = *Adamastor typus*, Bp., 1856 = *Proc. adamastor*, Schlegel, 1863 = *Adamastor cinereus*, Coues, 1864.

Proc. hesitata, Forst., 1774 = *Puff. hesitata*, Lawrence, 1853 = *P. hesitata*, Gould (sed non *P. hesitata*, Kuhl, 1823, nec Temm. Pl. Color. quæ species *Astrelate*) = *P. cinereus*, Gm.

Dr. Lichtenstein, in his edition (1844) of Forster's *Descriptiones Animalium*, says that the *leucocephala* of Forster (which is also the *alba* of Linn., Gm., Lath.) "vix nisi ætate videtur differre a *hesitata* Forster." It is well known that the present species when young has the cinereous of the head much lighter than that of the adults; and Prof. Lichtenstein's surmise may therefore be correct. As, however, there are several points of form, etc., in which it seems to differ from *hesitata*, and especially as Bonaparte has considered it a valid species of *Astrelata*, I shall follow the latter authority until more definite data may be found upon the subject.

ADAMASTOR GELIDUS Coues ex Gmel.

Procellaria gelida, Gmelin, Syst. Nat., i. pars 2, 1788, p. 564. Latham, Index Ornith., ii. 1790, p. 822. Vieillot, Nouv. Dict. d'Hist. Nat., xxv. 1817, p. 419. (Haud dubiè, opinor.)

Procellaria flavirostris, Gould, Ann. et Mag. N. H., 1844, 1ma ser. xiii. p. 365. *Adamastor flavirostris*, Bp. Consp. Av., 1856, ii. p. 188.

Habitat.—Antarctic Ocean. Cape of Good Hope.

Sp. char.—"Feathers of the head and all the upper surface brown, with paler edges, fading into white on the tips of the upper tail coverts; wings and tail deep blackish brown; all the under surface pure white; the feathers of the under surfaces of the shoulders with a streak of brown down the centre; bill yellow, passing into dark horn color at the tip; tarsi and feet fleshy white.

"Length 19 inches; bill $2\frac{4}{5}$; wing 15; tail $6\frac{1}{2}$; tarsi $2\frac{3}{8}$; middle toe and claw $3\frac{3}{8}$."—[GOULD.]

This is an exceedingly well marked species, liable to be confounded with no other with which I am acquainted. That it is a species of *Adamastor*, and entirely congeneric with *A. cinereus*, there can be, I think, no doubt. The general coloration and the proportions as indicated by the measurements, plainly evince this to be the case. Moreover, Mr. Gould himself remarks that "this bird so nearly approaches in form the members of the genus *Puffinus*, that it is almost a question whether it should not be included in that genus." A bird which could be placed by so accurate an ornithologist as Mr. Gould in the genus *Procellaria* (i. e. among the Fulmaræ), and which yet exhibits such an affinity with the Puffinæ, cannot but belong to the genus *Adamastor*.

Discussion of synonymy.—I think there can be no reasonable doubt that the old *P. gelida* of Gmelin, Latham and Vieillot is really the present species. The habitat and the dimensions given by these authors is the same as that assigned to *flavirostris* by Mr. Gould; and their diagnoses are pertinent in almost every particular. The expression "pedibus cæruleis" is indeed quite inadmissible; but a misinterpretation of the color of the feet of birds of this family is extremely likely to occur when only dried skins are examined. Still I would hardly venture to supersede Gould's *flavirostris* by Gmelin's or Latham's *gelida*, were it not for the fuller and more perfect description of the species given by Vieillot in the work above quoted. An examination of his description will show that it differs in no single consequence from Gould's.

quential point.* In view of these facts, and deeming it of the utmost importance to identify as many of the names of the older authors as possible, I have thought it best to restore Gmelin's appellation.

ADAMASTOR SERICEUS Bp. ex Less.

Puffinus sericeus, Lesson, Man. Ornith., ii. 1828, p. 402. *Adamastor sericeus*, Bp., Consp. Av., 1836, ii. p. 188.

Habitat.—Southern Pacific Ocean.

Sp. char.—Bill black; feet flesh-colored, the margins of the webs blackish. Upper parts deep greyish ashy, passing into blackish grey on the upper wing coverts. Head, neck and under parts white; the former variegated with some touches of clear greyish ash. Circumocular region blackish. Inferior surfaces of the wings of a lighter color than the superior. Tail rounded, its upper surface lightly washed with ashy.

Length 15 inches; extent of wings 36; wing from the carpus 11.50; tail 5; bill along gape 2.00; nasal tubes .40; tarsus 1.75; middle toe 1.33.

The preceding description is compiled from Lesson's original notice. The indications are not as explicit as might be desired; but I think that there can be no doubt of the propriety of Bonaparte's referring the species to his genus *Adamastor*. The pattern of coloration is rather that of most of the species of *Astrelata*; but the proportions as indicated by Lesson's measurements indicate a bird congeneric with *Adamastor cinereus*.

I have met with no synonyms of this species requiring notice.

THIELLUS Gloger.

Char.—Bill long and slender, about three-fourths the tarsus, compressed, the unguis much decurved, but at base broader than high. Nasal tubes very short, only a fifth of the culmen. Wings of moderate length, and ordinary shape. Tail unusually lengthened, being nearly or quite half as long as the wing from the carpus, very much graduated. Tarsus a fourth longer than the bill, moderately stout, compressed. Middle toe without a claw, a little longer than the tarsus. Of moderate size, rather slender form and uniformly fuliginous colors.

The most essential character of the genus is found in its unusually elongated and much graduated tail. In all other respects it hardly differs at all from *Nectris*; and its species have all the same fuliginous hue that characterizes the latter genus.

Two species are recognized by ornithologists as belonging to this genus. Though exceedingly closely allied to each other, yet they seem to constantly differ in some applicable points.

THIELLUS SPHENURUS Bp. ex Gould.

Puffinus sphenurus, Gould, Ann. et Mag. N. H., 1844, 1ma series, xiii. p. 365. Id. Birds Austral., vii. pl. 58. *Thiellus sphenurus*, Bonap., C. A., 1856, ii. p. 201.—*Procellaria sphenura*, Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 25.

Habitat.—Australian seas.

A fine series of these species is in the collection of the Philadelphia Academy. The general color of the plumage is a deep chocolate brown, or dark reddish black, most of the feathers of the upper parts with paler margins. The color of the back deepens into pure black on the wings and tail. Below, the general plumage is of a deep brown, with a wash of grey,—the brown tinge most palpable on the abdomen, the grey predominating on the throat.

* I may remark, *en passant*, that the expression "près de huit poncees de longueur totale" is most probably a typographical error, or a *lapsus calami*. It was evidently intended to be "*dix huit*."

The bill is flesh color, tinged with brown; much darker along the culmen and on the unguis; the legs and feet are flesh colored, with a tinge of yellow.

This species measures from 15 to 16 inches in total length; the wing from the carpus 10.50 to 11.25. The tail varies somewhat in length, from nearly five to quite six inches; the graduation of the lateral feathers usually being about 2 inches. Bill about 1.60; height at base .35, width .50; length of nasal tubes .25. Tarsus 1.90; middle toe and claw 2.35.

This species can be confounded with no other, (except, perhaps, *T. chlororhynchus*, which see;) and there are no involved points of synonymy.

THIELLUS CHLORORHYNCHUS Bp. ex Less.

Puffinus chlororhynchus, Lesson, Tr. Ornith., p. 613. Pucheran, Rev. Zoologique, 1850, p. 633. *Thiellus chlororhynchus*, Bp., Consp. Av., ii. 1866, p. 201. *Procellaria chlororhynchus*, Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 25.

Habitat.—"Western Australia," Bp. Dr. Schlegel has specimens from the Bourbon Islands and the Cape of Good Hope.

Almost identical with *T. sphenurus* in the color of the plumage; and with much the same dimensions. The main diagnostic points seem to be the following: The bill is of a greenish orange color, except along the culmen and at the tip, where it is black. The bill is longer than that of *sphenurus* by about a fourth of an inch on the average, and appears a little larger at the base, though quite slender in its continuity. While *chlororhynchus* is, upon the whole, a larger bird than *sphenurus*, nevertheless the wings are absolutely shorter ($\frac{1}{2}$ an inch or more) on an average. The feet are slightly longer and stouter. In color the present species differs slightly in being rather more cinereous below; but the difference is not well marked.

The species not as yet a well known one, nor contained in many musæa.

NECTRIS Bp. (emend. ex Forst.)

Char.—Generally similar to *Puffinus*; colors uniformly fuliginous; bill and feet wholly or partially light colored. Bill long and slender, much hooked at the tip; nasal tubes short, broad, depressed, very obliquely truncated, the septum broad, the nostrils narrowly oval. Wings reaching a little beyond the tail, which varies in length, but is always more or less rounded. Feet moderate; tarsus about equal to middle toe without claw; outer toe without claw equal to middle; tip of inner claw not reaching base of middle one.

This genus comprises five, perhaps six, species, all agreeing in the uniform fuliginous of their plumage, and in the partial or entire paleness of the bill and feet. In form it hardly differs from *Puffinus*, and its retention as a valid genus is perhaps questionable, except as a matter of convenience in a group where it is of importance to distribute the numerous closely-allied species in as many groups as may be at all characterizable.

NECTRIS FULIGINOSUS, Keys. et Blas. ex Strickl.

Puffinus fuliginosus, Strickland, Proc. Zool. Soc. Lond., 1832, p. 129. Lawrence, Birds N. A., 1858, p. 803, et auct. recent. Sed non *Proc. fuliginosa*, Gm., Lath., quæ probabiliter species *Thalassidromæ* (caudâ furcatâ ex "Otaheite"); nec Banks, tab. 19, Kuhl, sp. 12, pl. x. fig. 6; quæ certè *Pterodroma atlantica*, Gould. Quid sit *Proc. fuliginosa*, Kuhl, p. 148, sp. 27 (ex Banks,) nescio.—*Nectris fuliginosa*, Keys. et Blas. Wirbelt. Europ., 1840, p.

Puffinus major (femina!) Temminck, Man. Orn., iv. 1840, p. 506. *Puffinus cinereus* (femina!), Gould, Birds Europ., pl. 445, fig. 2.

Habitat.—More northern portions of the Atlantic Ocean; especially numerous off the coast of Newfoundland; more rarely on the European coast.

Sp. ch.—Upper parts a uniform fuliginous brownish black, the primaries and tail feathers of a deeper color; under parts a much lighter fuliginous
1864.]

brown, passing into greyish on the throat. Bill entirely brownish black. Feet brownish black, the internal face of the tarsus and the interdigital membranes dusky yellowish. Length, 18 inches; wing, from the carpus, about 12. Bill along culmen, 1.72 to 2.00; along commissure, 2.50; tarsus 2.20 to 2.30; middle toe about 2.50.

This species is too well known to require further characterization.

Discussion of synonymy.—The name "*fuliginosus*" has unfortunately been almost as badly bandied about as has *cinereus*, Gm. Thus the *fuliginosus*, Gm., Lath., apparently (and it is so looked upon by most ornithologists.) belongs to a species of the genus *Thalassidroma*, Vig., from Otaheite, probably not very widely differing from the *Cymochorea melania*, mihi, ex Bp. *Fuliginosa*, Banks, (tab. 19.) Kuhl, (sp. 12, pl. x. fig. 6.) is a species subsequently called *atlantica* by Gould, now the *Pterodroma atlantica*, Bp. Exactly what is the *fuliginosa*, Forster, (Descr. p. 23, sp. 18), is a little doubtful. His editor, Lichtenstein, says that it is the same as *fuliginosa*, Kuhl, sp. 12; and this opinion is also maintained by Bonaparte, which would make it the *Pterodroma atlantica*. But then, on the contrary, Dr Kuhl asserts positively that his species 12 is "omnino diversa a *Nectris fuliginosa*, Forst." For my own part, after carefully studying Forster's description, I am inclined to coincide with Dr. Kuhl, and to hold that Forster's *fuliginosa* is not the *Pterodroma atlantica*, but rather a pacific species of the genus *Nectris*.

Species 27 of Kuhl's monograph, also called *fuliginosa* (after Banks, tab. 23), is too indefinite for me to make anything of it.

No other synonyms of this species seem to require notice. The confounding of this species with *carneipes*, Gould, by Dr. Schlegel, will be noticed under the head of the latter.

NECTRIS AMAUROSOMA, Coues, nov. sp.

Diagnosis.—*Nectris* media quoad staturam inter *fuliginosam* vel *carneipedem* et *tenuirostrem* vel *brevicaudam*; corpore brunneo-fuliginoso, subtus valde dilutiore, in gulâ fusco-cinerascente; tectricibus alarum inferioribus albidis ferè meris; rostro ex toto fusco; pedibus internè palamisque carneis, externe brunneo-albis. Long. alæ 11.00 poll. Ang. Rostrî à fronte ad apicem 1.70. Tarsi 2.00. Digiti medii cum ungue 2.40. Caudæ, 4.25.

Habitat—Mare Pacif., circum capit. Sanct. Lucas, Calif.

Description.—Form. Bill about as long as the head, a little shorter than the tarsus, about two-thirds the middle toe and claw; rather slender, attenuated, compressed, except at base, where it is as wide as high; the unguis large, and much hooked; commissure much curved from base to unguis; outline of rami of inferior mandible quite straight. Nasal tubes rather more than a fourth the length of the culmen, broad, but much depressed, with an indistinct median longitudinal groove; terminally exceedingly obliquely truncated; the nostrils oval. The feathers of the front form a very obtuse angle on the culmen, but instead of immediately retreating on either side, they extend forwards again on the sides of the upper mandible, nearly as far as on the culmen. Wings of ordinary length and shape. Tail rather long, contained only $2\frac{1}{2}$ times in the wing from the carpus; much rounded, as usual in the genus. Feet moderately stout; tarsus just equal to the middle toe without its claw; outer toe without its claw longer than the middle; inner toe unusually abbreviated, the tip of its claw falling $\frac{1}{4}$ of an inch short of the base of the middle claw.

Color.—The bill is wholly deep brownish black; somewhat lighter on the sides of the lower mandible; the extremity of both unguis horn colored. The inner aspect of the tarsus, the middle and inner toes, the whole of the webs, and the bases of the claws, clear light yellowish flesh color; the outer aspect of the tarsus, the outer toe, and tips of the claws, the same color, but much tinged with brown. The shade of the upper parts is a pure deep chocolate

[April,

brown, without the slightest tinge of ashy; a little darker on the rump, so dark as to be brownish black on the wing coverts and tertials; the extreme tips of which latter are somewhat paler. The primaries are lustrous brownish black on their outer webs and at their tips; and their inner webs are but little paler; their shafts are on their superior aspect black, becoming brownish basally; their inferior aspects also black, but with a delicate white line running medianly two-thirds their whole length. The rectrices are colored like the primaries; their shafts are brownish black. The entire under wing coverts are white; the purity and continuity of which is, however, interrupted by some grayish brown marbling. The under parts generally are much lighter than the upper, and of a grayish rather than brownish fuliginous, this color passing on the throat and chin gradually into a somewhat grayish cinereous hue. The short anterior under tail coverts are light grayish brown; the long posterior ones are more of a brownish fuliginous. There is a delicate touch of white on the under eyelid.

Dimensions.—Length of bill along culmen 1·70; from feathers on side of lower mandible to its top, 1·60; length of nasal tubes, ·45; height of bill at base, ·45; width about the same. Wing, from the carpus, 11·00; tail, 4·25; graduation of lateral rectrices, ·90; tarsus, 2·00; middle toe and claw, 2·40; outer do., 2·30; inner do., 1·90.

It may seem somewhat improbable that a species of *Nectris* has remained to this late day undescribed; but the subject of the present article differs in so many particulars from any known bird of the genus, that I have not the slightest hesitation in presenting it as new. It is most closely allied to *fuliginosa*, Strickl., but differs from it, as well as from *carneipes* and *tenuirostris*, in many very tangible points. The combination of the wholly dark bill, with the coloration of the feet, as above described, the white on the under surfaces of the wings, together with its own particular dimensions, readily characterize it among its congeners. The following detailed comparison of it with each may serve to define its relationships more explicitly.

With the general colors of *fuliginosus*, especially as regards the wholly dark bill, it differs in the conspicuous white under wing coverts, only a little obscured by grayish brown, and in the different tints and pattern of the feet. (Compare original descriptions of each species.) It is much smaller than that species,—to wit: the length about fifteen inches, (as near as I can judge from the skin,) instead of eighteen; the tarsus barely two inches, instead of two and a quarter; the toes less in proportion; and the wing eleven, instead of twelve inches.

It is more nearly of the same size as *carneipes*, but in that species the "whole of the plumage is chocolate black;" the bill is flesh colored, except on the culmen and at the tip, whereas in my bird it is wholly dark. The feet of *carneipes* are wholly "yellowish flesh color," while in *amaurosoma* the external aspect of the tarsus and the outer toe are brownish white.

The species hardly requires any comparison with *tenuirostris* or *brevicauda*, the notable differences of color alone, or of dimensions alone, at once separating them. The bill of *amaurosoma* measures about 1·70 inches; that of *tenuirostris* 1·20; the wing 11, instead of 10 inches; the tail 4·75 to 5·00, instead of 3·50, etc. The general color of *tenuirostris* is a deep smoky black, with a tinge of ashy; that of *amaurosoma* brownish fuliginous. Compare also the descriptions given in this paper of the colors of the bill and feet. There is just about the same amount of whitish on the under surfaces of the wings of the two species.

The type of this species, now in the Smithsonian collection, was procured by Mr. John Xantus at Cape St. Lucas, Lower California, August 18th, 1860. It is there apparently the representative of *fuliginosus*, as my *opisthomelas* is of *obscurus*.

1864.]

NECTRIS CARNEIPES, Bp. ex Gould.

Puffinus carneipes, Gould, P. Z. S. xii. March 26, 1844, p. 57. Id. Ann. et Mag. N. H., 1844, xiii. 1ma., series, p. 365. *Majaqueus carneipes*, Reichenbach, Syst. Av., pl. xxiv. fig. 2601. *Nectris carneipes*, Bonaparte, Consp. Av. ii. 1856, p. 201. *Procellaria carneipes*, Schlegel, Mon. Proc. Mus. Pays-Bas, 1862, p. 26, (sinè bonâ ratione *Nect. fuliginos*. Strickl. conjuncta.)

"*Puffinus cinereus*, Smith, Ill. S. Afric., Bds., pl. 56." "*Nectris gama*, Bp. Consp. Av. ii. p. 202;" de utroque teste Schlegelo.

Habitat.—"Numerous in all the seas bounding the western coast of Australia; and breeding on the small islands off Cape Leeuwin."—[GOULD.]

This species is quite closely allied to *fuliginosus*, but differs from it by exceedingly well marked characters. The plumage is much the same in both species, but the bill of *carneipes* is "fleshy white, the culmen and tips of the mandibles brown; the legs, feet, and membranes, yellowish flesh-color." Besides these differences in color, there appear to be equally marked discrepancies in proportions; thus, while *fuliginosus* is eighteen inches long, and *carneipes* only fifteen, the absolute lengths of the bill, feet, and wings is very nearly the same. (Compare original descriptions by Strickland and Gould.) I have never seen any example so small as the one whose measurements are given by Dr. Schlegel, p. 26 of his monograph, but the limits within which any species of this family may vary are very great. But even granting for a moment the identity of the two species, I do not see upon what authority Dr. Schlegel has given the name *carneipes* of 1844 priority over *fuliginosus* of 1832.

Bonaparte, in his Conspectus, has a species *N. gama*, from South Africa, with which he considers *Puff. cinereus*, juv., Smith, as synonymous. I have never had an opportunity of examining a specimen professing to be of this species; but as the diagnosis scarcely shows tangible points of difference, and as Dr. Schlegel is convinced of its identity with *carneipes*, I shall, for the present at least, follow his authority in assigning it as a synonym of that species.

An excellent suite of specimens of *carneipes* is in the collection of the Philadelphia Academy.

NECTRIS TENUIROSTRIS Bp. ex Temm.

Procellaria tenuirostris, Temminck, Pl. Col., No. 587. Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 26. *Puffinus tenuirostris*, Temm. et Schl., Faun. Japon. Aves., p. 131, pl. 86. *Nectris tenuirostris*, Bonaparte, Consp. Av. ii. 1856, p. 202. "*Proc. curilicus*, Musæorum Berol. et St. Petersburg."

"*Puff. tristis*, Mus. Parisiensis."

Habitat.—Japan, and neighboring seas.

I have before me a typical example of this marked species, from Nippon, agreeing in every respect with the types of the species as described by Schlegel.

The most peculiar character of form of this species is found in the shape of the bill. It is stout at the base, where it is a little broader than high, but rapidly becomes both compressed and depressed, tapering to a small, weak, only moderately hooked unguis. This unusually weak bill is also short, being much less than the head, and only about two-thirds the tarsus. The nostrils measure about a third the length of the culmen. The commissure and outline of the inferior mandibular rami are both nearly perfectly straight. The wings are very long, reaching much beyond the rest; the primaries are all tapering and acute. The tail is exceedingly short, its length being contained nearly three times in the wing from the carpus, the central retrices projecting a little, the lateral rapidly graduated. The feet are moderately large and

[April,

stout; the tarsus is about equal to the middle toe without its claw; the outer toe and claw are equal in length to the middle toe and claw; the tip of the inner claw falls short of the base of the middle.

Bill mostly dusky greenish yellow, brighter along the commissure and at tip. Feet yellowish on the anterior, exterior and internal aspect of the tarsus and toes, and the superior surfaces of the webs, the posterior edge of the tarsus, and the under surface of the webs blackish. Above very deep sooty black, becoming pure black on the rectrices and outer webs of the primaries, with a just appreciable ashy nuance on the wing coverts. Inner webs of primaries (except at their tips) and the under surfaces of the wings generally light dull grayish brown. Shaft of primaries black, except along a groove on their under surfaces, which is yellowish. Beneath, the whole body is of a rather light fuliginous or brownish grey, fading, on the throat, (especially in more immature birds) almost into greyish white. The under tail coverts, however, are nearly as dark as the upper parts, only rather more fuliginous.

Dimensions. Wing from the carpus 10.00 inches: central tail feathers 3.50; lateral 2.75; bill along culmen 1.20; depth at base .30; width at base .40; tarsus 1.90; middle toe and claw 2.25; outer toe and claw the same; inner toe and claw just equal to the tarsus.

This strongly marked species is distinguished from all its congeners by its small size, weak, peculiarly shaped bill, very short tail, and peculiarly colored feet. The difference in intensity between the colors of upper and under parts are quite appreciable.

Synonymy. The proper name of this species is a matter of no uncertainty, but what designations are to be referred to it as synonyms is more doubtful. Both Bonaparte and Schlegel place "*curilicus*, Pennant," of the museums of Europe, as a synonym, which is merely, however, saying that certain museums have called *tenuirostris*, "*curilicus*," and does not in the least affect the question as to whether *curilicus* be properly a synonym. I am inclined to think that it is not, but that it is rather to be referred to another and larger species of this fuliginous genus.

Bonaparte and Schlegel both consider "*tristis*, Forster, Descr. p. 205," as synonymous with this species. It is difficult to say whether such is or is not the case; but my own impression, derived from a careful study of the characters laid down by Forster, is that his *tristis* refers to a species much larger, and with a stouter bill than the present; possibly the true *curilicus*, Penn.

NECTRIS BREVICAUDA Bp. ex Brandt.

Puffinus brevicaudus, Brandt, "Ic. Rossic. Av. pl. vi. fig. 17." Gould, Ann. et Mag. N. H., xiii. 1ma series, 1844, p. 365. Gould, Birds Austr. viii. pl. 56. *Majaqueus* (!) *brevicaudatus*, Reichenbach, "Syst. Av. pl. xxxvii. fig. 2271—2." *Nectris brevicaudus*, Bonap., Consp., Av. ii. 1856, p. 201.

Habitat. "Found in all the Australia seas, and breeds in the greatest abundance on several of the islands in Bass's straits." [GOULD.]

"Blackish fuliginous, lighter beneath; bill black, yellowish at the base; feet cinereous, their webs yellow." [BONAPARTE.]

This is a species with which I am autoptically unacquainted, nor have I access to the original description and figure of Brandt, and I am therefore unable to discuss its characters and relationships. By Dr. Schlegel it is placed as a synonym, with a query of *N. tenuirostris*, but other authors all agree in considering it as a valid species.

PUFFINUS Brisson.

Bill about as long as the head, or a little less, about three-fourths the tarsus, rather stout, a little higher than broad at the base, compressed for the 1864.]

rest of its length; the unguis strong, much hooked; nasal tubes about a fourth the length of the culmen, broad, depressed, obliquely truncated, the septum thick, the nostrils oval; wings long, pointed, first primary longest, surpassing the tail, which is lengthened and more or less rounded, of twelve rectrices. Feet very large and stout; tarsus compressed, as long as the middle toe and claw; outer toe about as long as the middle, but its claw much shorter and weaker; tip of inner claw not reaching the base of the middle one; claws strong, little curved, moderately acute, somewhat depressed, the middle one with its inner edge dilated; hallux extremely abbreviated, only apparent as a short, stout, conical, rather obtuse claw. Of moderate and small size. Bicolor: bill and a portion of the feet usually dark colored.

The genus *Puffinus*, as characterized in the above paragraph, comprises numerous bicolor species, spread all over the world. They form two groups. Those of the first group are large, with robust bills, and have the upper plumage brown or cinereous. They are *major*, *leucomelas*, *Kuhlii* and *creatopus*, which compose the "genus" *Ardenna*, Reich. The species of the second group are all much smaller, with very slender, weak bills, and the upper parts blackish or greyish black. They are *anglorum*, *yelcuanus*, *obscurus*, *opisthomelas* and *nugax*, forming the restricted "subgenus" *Puffinus*.

PUFFINUS KUHLLI, (Boie.)

Procellaria puffinus, "Linn.," Temminck, Manuel d'Ornith., ii. 1820, p. 805. Vieillot, Fauna Franç., 1828, p. 404, et auct. al. aliq. sed non Linnæi, quæ certè *P. anglorum*, Ray.

Procellaria cinerea, Kuhl, Mon. Proc. Beit. Zool. p. 148, pl. ix. fig. 12; ex oc. Atlantico Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 24; ex ocean. Atlant. Sed non Gmelini, vel Lathamii quæ certè *Adamastor typus*, Bp. est, ut benè et sepè vindicata est a Bonaparteo; ex maribus antarcticis præcip. Pacif.

Puffinus cinereus, Cuvier, Temminck, Man. Orn., vol. iv., 1840, p. 506. Degland, Ornith. Europ. ii. 1849, p. 362, et al. script. Europ. recent. ferè omnium. Sed non Auduboni, et auct. Amer. qui *P. major*, Faber: non Lawrencii, qui *Adamastor cinereus* hujus opusculi. *Nectris cinereus*, Keys. et Blas. Wirb. Europ. 1840, p. xciv.

Procellaria Kuhlîi, Boie, Isis von Oken, 1835, p. 257, sp. 25. *Puffinus Kuhlîi*, Bonaparte, Consp. Av. ii. 1856, p. 202. (Sed non Cassin, Pr. A. N. S. Philad., 1862, p. 327, quæ *Adamastor cinereus*, mihi, testibus speciminibus ipsis.)

Discussion of Synonymy.—There is in the Atlantic Ocean a very common and well known Procellariidian, to wit, the "cinereous Shearwater," a bird about the size of *Puffinus major*, Faber, but otherwise quite distinct from it in form, color, etc. This bird was named *Procellaria Kuhlîi* by Prof. Boie, in 1835. (Isis von Oken, p. 257, sp. 25, which consult.) From Boie's excellent characterization, and from the very marked distinctive features of the bird itself, there need have been no confusion or uncertainty regarding it. But before 1835, so common and well known was the bird, that it had been noticed by numerous other writers, and unfortunately most of them had erroneously applied to it Gmelin's name *cinerea*; while others had with equal inaccuracy called it *P. puffinus*, Linnæus. When more recently C. L. Bonaparte attempted to show that "*cinereus*, Gm., Lath.," was not the common Atlantic bird at all, but a Pacific species, (described as *P. hesitata* by Foster) and properly the type of a genus (viz., *Adamastor*, Bp.) distinct from *Puffinus*; the assertion was illy received by ornithologists, and the general confusion rather augmented than diminished. To the following attempt to unravel the knotty points of synonymy involved, I would invite the particular attention of ornithologists, as I hope to be able to sustain the position assumed by Bonaparte.

[April,

The following is Gmelin's diagnosis, in copying which the italics are my own: S. N. i. pars ii. p. 563, sp. 17. "*Pr. cinerea, subtus alba, cauda nigra, rostro flavicante, pedibus cærulescentibus.*" "Cinereous Fulmar," Latham, Syn. iii. p. 405, No. 10. *Habitat intra circulum antarcticum; glacialis magnitudine: 20½ pollices longa.*" It will be noticed that Gmelin's bird is one from the Antarctic seas, as large as the common Fulmar, and with exactly the characters of the bird afterwards designated as *Adamastor typus* by Bonaparte. Gmelin's further description will be found to confirm this opinion by each of its sentences. I do not see, therefore, how it is possible to consider it as referring to a North Atlantic species, with characters so very different as are those presented by *P. Kuhlîi*, Boie.

The *Proc. cinerea*, Lath., Ind. Ornith., ii. 1790, p. 824, and the *Proc. cinerea*, Vieillot, Nouv. Dict. D'H. N. 1817, xxv, p. 418, are both exactly the same as Gmelin's *cinerea*, and so is the *Puffinus cinereus* of Lawrence, Bds. N. A., 1858, p. 835, from the Pacific Ocean, under which head the synonyms of *Adamastor typus* are accurately enumerated.

The above is all that is necessary to be said, I think, to substantiate Bonaparte's position, that *P. cinereus*, Gm., is not the Atlantic bird afterwards named *Kuhlîi* by Boie. The subject will be resumed and the generic and specific characters of *Adamastor typus*, as distinguished from those of *Puffinus Kuhlîi*, will be enlarged upon in another place. It now only remains to discuss the various synonyms of *Kuhlîi*.

The first instance of the misapplication of Gmelin's name, *cinereus*, which I have been able to find, is that by Cuvier, when he calls *P. Kuhlîi* "*P. cinereus.*" This same malidentification has also been committed by Bonaparte, (Comp. List, Bds. N. A. and Eur., 1838, p. 64.) Degland, (Ornith. Europ., 1849, ii. p. 362;) Temminck, (Man. Orn., iv. 1840, p. 506; Schinz,) (Europ. Faun., 1840, i. p. 393;) Schlegel, (Rev. Crit. Ois. Eur., 1844, p. 132;) Keyserling and Blasius, (Wirb. Europ., 1840, p. 94.)

The *Puffinus cinereus* of Bonaparte (Synop. Bds. N. A., 1828, p. 370,) of Nuttall, (Man. Ornith., ii. p. 334,) and of Audubon's works, (Orn. Biogr. vol. iii. p. 555; Bds. N. Amer., vii. 1844, p. 212, pl. 456,) is, however, not the *P. Kuhlîi* but the *P. major*, Faber.

"The *Procellaria puffinus*, L.," of Temminck, (Man. Orn. 1820, ii. p. 805;) and of Vieillot, (Fauna Frang, 1828, p. 404) are synonyms of *P. Kuhlîi*.

Yet another improper reference of Gmelin's *cinereus* is found in Degland's Ornithologie Européenne, where it is placed as a synonym (with a query, however,) of *P. major*, Faber. This is just the mistake which has been generally committed by American Authors.

I am enabled to state positively, from autoptical examination of the specimens themselves, that the bird referred to by Cassin, in the Proceedings of the Philadelphia Academy for June, 1862, page 327, as *Puffinus Kuhlîi*, is really the *Adamastor cinereus*, Mihi. The specimens, three in number, collected by the North Pacific Exploring Expedition, are lying before me, and agree in the minutest particulars with the type specimen of Lawrence's *P. hesitata*, (Ann. N. Y., Lyc. N. H., 1853) which is also Lawrence's *P. cinereus* (Birds Amer., 1858, p. 835,) which is *Adamastor typus*, Bp.

Description. In general form not unlike *P. major*, but rather more graceful, with slightly slenderer and weaker bill, comparatively longer wings and tail, etc. Bill scarcely if at all shorter than the head, just equal to the tarsus, moderately stout, compressed, higher than broad at the base; unguis only moderately strong and hooked; commissure and outline of inferior mandibular rami a little curved, the former most so; nasal tubes unusually abbreviated, measuring not over a fifth of the culmen, but elevated, inflated, medianly subcarinate, apically obliquely truncated, the nostrils subcircular in outline; wings moderately long, a little exceeding the tail; tail quite long, so much rounded as to be almost cuneiform, the central rectrices much elongated. 1864.]

ated; feet rather weak and slender, moderately compressed; tarsus shorter than the middle toe without the claw; outer toe and claw longer than the middle with its claw, tip of inner claw about reaching base of middle one; claws obtuse, little arched, more or less dilated on their inner edge.

Colors. The upper parts are of a light smoky gray, or very light brownish ash color, this color uniform on the crown and nape, interrupted on the back by the pure or grayish white margins of all the feathers, which margins are broadest on the scapulars, deepening on the wing coverts and tertials into deep grayish brown, and also losing the white margins. The rump is concolor with the rest of the back, but the upper tail coverts have successively more and more white until the longest and most posterior ones are almost wholly of this color, with only some central touches of grayish brown. The primaries are deep grayish or brownish black, with, however, large white spaces which occupy the basal half or two-thirds of their inner webs. The outer webs, and apices of the secondaries are deep grayish plumbeous; the greater part of their inner webs white. The entire parts of the bird, from the chin to the extreme tips of the under tail coverts are pure white, except some slight soupçons of grayish on the flanks. The under surfaces of the wings, except just along the edges, and the axillary feathers are pure white. The connection of the color of the upper parts with the white of the under, on the sides of the head and neck, is peculiar; there is no line of demarcation whatever, but as the color of the upper parts becomes lighter in tint, so it becomes gradually more and more nebulated and undulated with white, the admixture of the two having a marked and beautiful effect. The under eyelid is wholly white, the upper less completely so. The bill is yellowish, darker along the culmen, the unguis light horn color. The legs and feet are yellowish, the webs still clearer yellow; the claws flesh colored.

Dimensions.—Length of bill along culmen 1·90, along gape 2·60, from feathers on side of lower mandible to its apex 1·75; height at base ·70; width ·60; tarsus 1·90; middle toe and claw 2·50, outer do. 2·55, inner do. 2·50; wing from the carpus 12·75; central rectrices 5·50, exterior do 4·75.

The variations in size to which this species is subject, are entirely parallel with those of *P. major*, detailed further on. The color of adult birds does not vary much, and that chiefly in the slightly different degree of clearness or obscurity of the upper parts. Younger birds, however, have the bill rather dusky than yellowish, and somewhat of a greenish or bluish tinge in the color of the feet. The upper parts are considerably darker than those of the adults, being rather more of a brownish plumbeous than of an ashy grayish tint.

PUFFINUS LEUCOMELAS Bp. ex Temm.

Procellaria leucomelas, Temminck, Planches colorées, No. 587.—Temm. et Schlegel, Fauna Japon. p. 131, fig. 85. Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 24. *Thiellus* sive *Nectris leucomelas*, Auct. aliq. *Puffinus leucomelas*, Bonap., Consp. Av. ii. 1856, p. 203.

With this species I am autoptically unacquainted, and therefore compile the following brief account from Dr. Schlegel's excellent Monograph, above quoted.

It is in general similar to *P. kuhlii*, which it appears to replace in the Pacific Ocean. It is smaller, however, than that species, slenderer in general proportions, and with a weaker bill. In color it is principally distinguished by having the feathers of the upper parts generally, and of the sides of the head and neck white, each with a brown longitudinal shaft line.

Length of wing from the carpus from $11\frac{1}{4}$ to 12 inches. Middle tail feathers $4\frac{1}{2}$ to $4\frac{3}{4}$ inches, external $3\frac{1}{3}$ to $3\frac{1}{2}$. Bill 22 to 23 lines; height at base 5 to 6 lines; width about the same. Nasal tubes $3\frac{1}{2}$ lines. Tarsus 21 lines; middle toe 23 to 25 lines.

Habitat.—Pacific ocean, particularly in vicinity of Japan.

[April,

PUFFINUS CREATOPUS Cooper (MSS.) Nov. Sp.

Diagnosis. *P. Puffini majoris* staturâ, nec ei coloribus perdisimilibus; sed rostro multo brevior, crassior, tubulis nasalibus inflatis; ferè omnino nisi ungue flavescens-carneo; pedibus brevioribus, gracilioribus, carneis; tectricibus caudæ superioribus et inferioribus ex toto brunneo-nigris; remigibus primariis spatio albo basin versùs interni pogonii carentibus.

Habitat.—South Pacific Coast of North America.

Specimen typicum et unicum in musæo Smithsoniano, (Catal. No. 31964,) ex insulâ "San Nicholas" prope Californiâ, a Chirurgo J. G. Coopero collectum. (Calend. Julii A. D. mdccclxiii.)

Description.—*Form*.—Bill a little shorter than the head or tarsus, about two-thirds the middle toe and claw; the most robust of the Puffinæ, being especially large and swollen at the base, where it is as wide as high. The culmen rises rapidly from the end of the nasal tubes to the strong, very convex and much curved unguis; the sides of the bill are considerably compressed beyond the nostrils. Commissure curved from the feathers to the unguis, the convexity looking downwards; outline of the inferior mandibular rami about straight. The basal tubes are very short, being hardly a fourth of the length of culmen; they are unusually elevated, turgid, and with a slight median furrow; very obliquely terminated; the nares are elliptical in outline. The feathers of the forehead run forward to form an acute angle on the median line. The tarsi are unusually weak and slender, though not very much compressed, and are shorter than the middle toe without the claw. The outer toe just barely exceeds the middle, but its claw is much shorter and weaker. The tip of the inner claw falls short of the base of the middle one. The wings are of the ordinary shape and dimensions, and have the usual proportionate length of the primaries. The tail is of much the same length and has the same amount of graduation of its lateral rectrices as in *P. major*.

Color.—The upper parts are of about the same shade of brown as in *P. major*, and the feathers have similar lighter margins, the head, however, having more decidedly a plumbeous cast. The upper tail coverts are entirely deep brownish-black, darker even than the rest of the upper parts, with no vestige of white. The inner webs of the primaries are entirely brownish-black to their very bases, with no indication of the white spaces which exist in *P. major*. On the sides of the head and neck, the color of the upper parts extends entirely round on to the chin and throat, having no distinct line of demarcation, but very gradually and insensibly becoming more and more mottled with white, until the latter becomes the predominating color; on the chin the plumbeous-black and the white are about equal in amount. The dark color does not extend further nor indeed so far on the sides of the breast as on the sides of the neck. The lower eyelid is pure white. The sides under the wings and the inferior surfaces of the wings are mottled with grayish-black and white in about equal amount. The long axillary feathers are entirely grayish-black, except just at their bases. The middle of the abdomen and the circumanal region are variegated with grayish-black and white. The under tail coverts are entirely fuliginous black, with somewhat of a grayish cast. The nasal tubes, the culmen and unguis of the bill are brownish-black; the rest of the bill light-yellowish flesh color. The legs and feet are entirely light flesh color. The claws are whitish with brown tips.

Dimensions.—"Length 19·00; extent of wings 45·00" (collector's label.) Bill along culmen 1·60; along gape 2·30; from feathers on side of lower mandible 1·50; height at base, ·60; width about the same; length of nasal tubes ·40. Wing from the flexure 12·50. Tail: exterior feathers 4·00, median 5·00; tarsus 2·10; middle toe and claw 2·65; outer do 2·50, inner do 2·10.

Comparison with allied species.—The present species is so very peculiar in 1864.]

most of its features, that it intimately resembles no other with which I am acquainted. It may be well, however, to notice the points of difference between it and *P. major* which is the most nearly allied species. There is but little difference in size between the two birds, *creatopus* being only slightly smaller, and the color of the upper parts is about the same in each. *Creatopus* may be at once recognized as follows: by its much shorter, stouter bill, usually turgid and thick at the base, with its very short swollen nasal tubes, and light flesh-color, except along the culmen and unguis; by its shorter, slenderer flesh-colored feet; by its entirely brownish-black upper tail coverts; by the extension of the dark color of the sides of the head and neck, far round on the chin and throat without any distinct line of demarcation; by the absence of any white at the bases of the primaries, and by the unusual amount of grayish-black mottling on the sides, the under surfaces of the wings, the axillary feathers, and circumanal region.

The shape of the bill is more like that of the common Atlantic *Kuhlii*; and the nasal tubes are quite as short. But the bill of *creatopus* is much stouter, wider and more turgid at the base, and the unguis is much more rapidly decurved. The color is quite different, (compare descriptions.) The legs of *cinereus* are yellow; of *creatopus* light flesh-color. The differences in plumage are too obvious to require comparison; e. g. *cinereus* has pure white under tail coverts; *creatopus* brownish-black, etc.

I have been unable to find any description which can be considered as indicative of this species, which I believe to be hitherto quite unknown. It is exceedingly interesting, from its many peculiarities of form and color. It is particularly to be noted, that it is the only "bicolor" species, that is, dark colored above and mostly white beneath, which has flesh-colored legs; this coloration of the legs being hitherto only known to its extent among the fuliginous species composing the subgenus *Nectris*.

The type and only known specimen of the species was taken by Dr. J. G. Cooper, at San Nicholas Island, off the coast of California. Its precise range of habitat is as yet unknown. Accompanying the specimen was a note from Dr. Cooper, stating that it was a species unknown to him and probably new, and suggesting, in the latter event, the exceedingly appropriate name by which I have designated it.

PUFFINUS MAJOR Faber.

Procellaria puffinus, Kuhl, Monog. Proc. Beit. Zool, 1823, p. 146, pl. xi, fig. 10; et auct. al. aliq.; sed non Linn., Gmel., Lath., quæ *Puff. anglorum* Ray; nec Temm. quæ *Proc. cinerea* Cuv. (*Kuhlii* Boie.)

Puffinus major, Faber, Prod. Isl. Orn. 1822, p. 56. Bp. Consp. Av. 1856, ii. p. 203.—Lawrence, Birds N. A. 1858, p. 833.—*Procellaria major*, Schlegel, Mon. Proc. Mus. Pays-Bas, 1862, p. 27.—*Ardenna major*, Reichenbach, Syst. av. t. xiv, fig. 770.

Puffinus cinereus, Bonap. Syn. Bds. N. A. 1828, p. 370, No. 311. Audub. Birds Amer. 1844, vii. p. 212, pl. 456; et al. script. Americ; sed non Gmel.

Habitat.—Atlantic Ocean, especially its northern and temperate portion. Mediterranean Sea. Atlantic coast of Africa. Cape of Good Hope. Terra del Fuego. Not the Pacific Ocean?

Synonymy.—This species has been presented under a variety of designations. Some authors have thought with Kuhl, that it is the one referred to by Linnæus, Gmelin and Latham, under the name of *Procellaria puffinus*. Elsewhere, however, I have proven, I think, that such is not the case, but that *P. puffinus*, Linn., is a synonym of *P. anglorum* Ray.

The *Procellaria puffinus* of Temminck (loc. cit.) is not this species, nor yet the *anglorum* (although he presents it as the real Linnæan *P. puffinus*;) but on the contrary, it is the *P. Kuhlii*, Boie, as is evident from the description and the synonyms quoted. I am quite at a loss however, to discover upon what

[April,

grounds Temminck asserts that the *P. puffinus*, Kuhl., and the *P. cinerea* Kuhl., are "le vieux et le jeune de la même espèce." Kuhl's descriptions certainly indicate the two different species; and his passable figures of their heads are distinct enough from each other. But if Temminck could stoutly maintain to the last that *P. fuliginosus*, Strickl., was the female of *P. major*, Fab. (!), it is the less to be wondered at that he should commit the error we are now discussing.

It is a little doubtful what species is referred to by Vieillot, Nouv. Dict. d'H. N. xxv, 1817, p. 421, under the name of "Le Pétrel-puffin, *Procellaria puffinus*, Lath." The dimensions given ("quinze pouces") appertain best to the *anglorum*; but the description is entirely that of the *P. Kuhlii*, which it is doubtless best to consider it. The *Procellaria puffinus* of Vieillot's Fauna Franç. 1828, p. 404, is undoubtedly the true *cinereus*.

Dr. Degland in his Ornithologie Européenne, p. 363, gives a good description of this species under its proper name of *Puff. major*, but he is in error in citing as synonyms the *Puffinus cinereus*, Brisson, or the *Procellaria cinerea* Gmelin and Latham.

Description.—Form: Bill but very little shorter than the head or tarsus, stout and subterete at the base, then gradually more and more compressed to the strong, deep, much curved unguis. Nasal tubes straight, about a fourth the length of the culmen, somewhat dilated, the apertures widely separated, sub-elliptical. The culmen rises gradually with a slight but continuous concavity from the nostrils to the summit of the unguis. The commissure from the insertion of the feathers to the declination of the unguis is a long regular curve, whose convexity looks downwards. The outline of the inferior mandibular rami is nearly straight. The bill is about three times as long as it is high at the base, considerably less wide than high. The primaries are long, somewhat narrow, rather acutely pointed, the first longest, the second nearly equal, the rest rapidly graduated. The tail is long, being contained only about two and a third times in the wing from the carpus; so much rounded as to be almost cuneiform; the central rectrices projecting considerably, and the lateral being much abbreviated. The tarsus is as long as the middle toe alone, compressed as usual, but very stout and strong. The outer toe is as long or slightly longer than the middle, but the small size of its claw makes it fall short of the tip of the middle claw. The inner toe is unusually abbreviated, the tip of its claw falling far short of the base of the middle one.

Color.—Upper parts dark bistre brown; on the head inclining a little to plumbeous or grayish brown; on the tertials and rump the deepest; each feather of the back, rump, and wing coverts with a margin of lighter brown, which in freshly plumaged birds is so light as to be almost ashy white; on the head the color is uniform without any lighter margins, and it extends considerably below the eyes, just to the level of the gape, having a clear and distinct line of demarcation with the white of the throat. Posteriorly on the side of the neck the white reaches further round on the nape, and has a more indefinite outline. Backwards still on the sides of the breast, the dark color reaches farther down, encroaching on the white of that region. The upper tail coverts, especially the longest and most posterior ones, are mostly white, but with transverse rays or central spaces of brown. The primaries are brownish black, deepest on their outer webs; on their inner webs, towards their bases, gradually lightening till they become brownish white, or even nearly pure white, in freshly plumaged birds, especially on the innermost primaries. The under parts from chin to anus are white; this color interrupted on flanks by the more or less numerous, large, isolated, dark brown patches, which coalesce just over the flanks. The under surfaces of the wings are white, except just along their edges where they are mottled with brown; and the apices of the long axillary feathers are brownish. The under tail coverts are deep grayish
1864.]

brown, more or less conspicuously tipped with whitish. The tail feathers are like the outer primaries. The bill is deep blackish horn. The outside of the tibiae and the exterior toe are brownish; the rest of the feet including the webs yellowish flesh color.

Dimensions.—Total length 18.00 to 20.00 inches and hundredths; expanse of wings 43.00 to 45.00. Bill along culmen 2.00; from feathers on side of lower mandible to tip 1.75; depth at base .65, width .60; wing from the carpus 13.00; tail: central feathers 5.75; exterior do. 4.75; difference 1.00; tarsus 2.40; middle toe and claw 2.90; outer do. 2.75; inner do. 2.30.

Variations.—The differences in dimensions which this large species presents are so great that the above measurements can only be considered as an average; and individuals will be found considerably above and below the standard. The bills of various specimens, as well as the tarsus and toes, differ to the amount of two or even three tenths of an inch; the wings from the carpus three-fourths of an inch, or more, and the tail proportionally. The relative proportions, however, and the shape of these several parts appear to be pretty constant.

There also exist greater variations in color than are found in most of the species. The difference appears to depend chiefly upon age, or rather upon the age of the feathers themselves. Just after the moult, when the feathers are fresh and new, they are of a clear deep brown with a considerable of a plumbeous tinge, and their margins are exceedingly light colored, in fact almost white on the tertiaries, etc. With advancing age the feathers become more and more of a duller brown, much like that given by Audubon in his plate; the margins are broader, less deeply defined, and simply of a dull grayish brown. Constant characters, however, seem to be the uniformity in color of the feathers of the head, there being no light margins to them; the peculiar line of demarcation on the sides of the head and neck, and the partially white upper, and almost wholly dark under tail coverts. Audubon's plate of this species, otherwise excellent, is very wrongly colored as regards the bill and feet. The bright tints he gives them rather appertain to another species.

Notwithstanding these variations, the present species is so marked a one that it is not readily to be confounded with any other. Some small and light colored specimens look something like examples of *P. kuhlii*; the exact differences between the two will be given under the head of the latter. From *P. anglorum*, its size and the color of the upper parts at once distinguish it. *P. obscurus* and its allies are too different to require comparison. *P. major* may always be recognized by the peculiar size and shape of the bill (carefully examine preceding description); by the lighter margins of the feathers of the upper parts; by the line of demarcation of the white and brown on the sides of the head, as above given; and by the colors of the under tail coverts and flanks, which are the reverse of those of *Kuhlii*, its nearest ally. However light the color of the upper parts may be, they never acquire the real ashy tint which is a distinguishing characteristic of the latter species; and the colors of the bill and feet are always conspicuously different.

This species has an exceedingly extensive range. It apparently inhabits the entire Atlantic Ocean, up to exceedingly high latitudes. Dr. Schlegel has specimens from points on the west coast of Africa and from the Cape of Good Hope. A specimen before me from Terra del Fuego, collected by Mr. T. R. Peale, Naturalist of the U. S. Exploring Expedition, is identical with the common north Atlantic bird.

PUFFINUS ANGLORUM, Temm. ex Ray.

Procellaria anglorum, Raii Syn. 1713, p. 134, sp. 4. Temminck, Man. Orn. ii. 1820, p. 806. Schlegel, Mus. Pays-Bas, 1863, p. 28. *Puffinus anglorum*, Brisson, Ornith., 1760, vi. p. 131. Temminck, Man. Ornith. iv. 1840, p. 509. Bp. Consp. av. 1856, ii. p. 203. Lawrence, Gen. Rep. Bds. N. Amer., 1855, p. 834; et auct. recent. ferè

[April,

omnium. *Nectris anglorum*, Kuhl. Monog. Proc. Beit. Zool., 1820, p. 146, sp. 23.

Procellaria puffinus, Brünn., Orn. Bor., 1764, p. 29, sp. 119. Linn. Syst. Nat. i. 1766, p. 213; Gmel. S. N. i. 1788, p. 566. Lath. Ind. Orn. ii. 1790, p. 824; sed non auct. aliorum, quæ potius ad *Puff. majorem* spectat.) *Nectris puffinus*, Keys. et Blas. Wirb. Europ. i., 1840, p. 94.

Puffinus arcticus, Faber, Prod. Isl. Orn., 1822, p. 56, sp. 1. *Puffinus Baroli*, Bonelli; Bp. Consp. Av., 1856, ii. p. 204; (an = *P. "anglorum"*, ex Mare Medit.; an sub. *P. yelcuano* adducenda?) *P. "manksii"*, aliq.

Habitat.—North Atlantic Ocean, at large.

This species, though so long known and so common, yet requires very careful investigation; both because its bibliography is somewhat extensive, and on account of its variations in size and color, which are so considerable that there has been much confusion concerning it. I will first examine into its synonymy, and then proceed to characterize the species beyond the probability of any further difficulty with its specific characters.

The *Procellaria puffinus* of Linnæus, Gmelin, and Latham, has been variously interpreted by modern authors. Most writers, including Kuhl and others, consider it as the bird which was afterwards named *P. major* by Faber. Temminck makes it equal to the *cinereus* of Gmelin. Bonaparte and Schlegel regard it as undoubtedly referring to the present species. An examination of the diagnoses of Linnæus, or Gmelin, or Latham,—particularly the latter,—will, I think, make it quite patent that the last is the only tenable view to take of the name. Such expressions as are found in e. g. Latham's notice, as "*Pr. corpore supra nigro, subtus albo*" * * * "*15 pollices longa*," etc., can only be considered as referring to the *anglorum*; for they are totally at variance with the essential characters of the *P. major*. Moreover, Latham cites "*P. anglorum*, Raii, Syn." as a synonym of the species. Such being the case, I unhesitatingly accord with Bonaparte and Schlegel in their identification of the Linnæan *P. puffinus*. I am quite at a loss to understand upon what grounds M. Temminck makes the remark that "*ni Linné ni Latham n'out connu cet oiseau*."

The first recognized classical notice of this species is that given in 1713 by Mr. Ray, under the name of *Proc. anglorum*. Brisson calls it *Puffinus anglorum*; it is indicated by Linnæus, Gmelin, and Latham as *Proc. puffinus*, with "*anglorum*, Ray," as a synonym. Temminck was, I believe, the first binomalist who adopted Ray's designation; he calling it in 1820 *Procellaria anglorum*; in 1840 *Puffinus anglorum*.

This species is also the *Proffinus arcticus*, Faber (l. c.), as is evident from his diagnosis. The reference of Faber's name *arcticus* to the *P. major*, as has been occasionally done, is quite erroneous. I have an indistinct recollection of having seen this species cited as *Procellaria* or *Puffinus* "*manksii*," but I cannot at present call to mind the reference.

A certain "*Puffinus Baroli*, Bonelli," is admitted as distinct by Bonaparte in his *Conspectus*, p. 204, and also in his *Tab. Longip.* in the *Comptes Rendus*. It is said to be somewhat smaller, lighter colored, and with a slender bill. Well acquainted as I am, however, with the variations in just these features which the *anglorum* frequently presents, I cannot discover sufficient grounds upon which to separate *P. Baroli* even as a distinct variety; but rather entirely agree with Dr. Schlegel in considering it as an undoubted synonym of *anglorum*, or at least of *P. yelcuanus*, which is the representative species in the Mediterranean Sea.

Bonaparte (*Consp.* ii. p. 203) inquires "*quid Proc. puffinus*, Kuhl, Mon. Proc. p. 146, sp. 22, t. xi., f. 10, ex *Mediterraneo*?" to which I would reply unhesitatingly that it is the *Puffinus major*, Faber. The description is entirely pertinent, and the figure much more readily recognizable as representing the head and bill of this species, than are many of the delineations of the work.

1864.]

Description.—*Form*:—The bill, measured from the frontal feathers, is about three-fourths as long as the skull, rather more than two-thirds the tarsus. Its height at the base is just about equal to the width. Its height at the point of greatest convexity of the unguis hardly exceeds that at the middle of the culmen. The unguis is not very strong, its convexity only moderate. The commissure at first curves gently upwards, then still more gradually downwards for the whole length of the bill, and then is pretty strongly deflected along the edge of the unguis. The outline of the lower mandible is about straight to the unguis, a little concave thence to the tip. The length of the nasal tubes is a little less than a fourth that of the culmen. The outline of the feathers on the upper mandible is the segment of a perfect circle. The folded wings just about reach to the end of the tail. The second primary is nearly as long as the first, the rest successively more and more rapidly graduated. The tail is contained about two and a third times in the wing from the carpal joint. It is much rounded, the lateral rectrices all regularly graduated; the exterior just three-fourths of an inch shorter than the central pair. The tarsus is just as long as the middle toe without its claw. The external toe and claw is a little longer than the middle toe and claw. The tip of the inner claw falls short of the base of the middle one. The claws are all nearly or quite as broad as high, being much dilated on their inner edges.

Color:—The entire upper parts are of a deep lustrous black, with a soupçon of brownish, especially when the feathers are old and worn. On the front and sides of the head and neck the black has a grayish or plumbeous cast. This color extends on the sides of the head much below the eyes, in fact quite to the throat, but it is more or less marbled with white. The under eyelid is pure white, in marked contrast with the surrounding black. On the sides of the neck the white extends further round towards the nape; on the sides of the breast, on the contrary, the color of the back extends a considerable distance, it being of a decided greyish plumbeous hue, and gradually becoming more and more marbled with white till it entirely disappears. The primary quills are black, as are their shafts, their inner webs fading into dull grayish brown. The entire under parts, from chin to under tail coverts, are pure white, with the single exception of a few feathers just on the flanks, and of the outer webs of the exterior row of under tail coverts, which are plumbeous black. The under surfaces of the wings and the axillary feathers are pure white, with a slight marbling of blackish just along the bend of the wing. The caudal rectrices are like the primary quills; the inferior surfaces of their shafts grayish white. Bill deep greenish black, some part of the lower mandible yellowish. Part of outer side of tarsus, whole of outer side of exterior toe and the claws brownish black; rest of feet light yellowish, including the webs.

Average dimensions:—Bill along culmen 1.40; height at base .45; width about the same; along rictus 2.10; from feathers on side of lower mandible to its tip 1.40; wing from the carpal joint 9.25; tail: exterior feathers 3.25, middle 4.00; amount of graduation .75; tarsus 1.80; middle toe and claw 1.90; outer do. 2.00; inner do. 1.55. Total length about 14.00; extent of wings about 33.00

Variations.—As to dimensions, these are quite considerable. As usual among *Puffini*, the bill differs a good deal in absolute size, as well as in robustness, generally preserving its shape, however, quite constantly. The longest bill before me measured 1.50; the shortest 1.30, along culmen, with a corresponding difference in other dimensions. The wing from the carpal joint varies nearly half an inch, and the tail to a corresponding degree. The total length of tarsus and toes varies about a third of an inch. In color the species is more constant, the chief variation being in the greater intensity or more decided brownish tint of the black of the upper parts. Younger specimens have more marbling of the plumbeous black and white on the sides of the breast, the color sometimes reaching nearly or quite across the breast, or

[April,

even invading the throat. In immature individuals, also, the lateral inferior caudal tectrices may be more extensively hued with plumbeous black. They are never, however, so much darkened as is usual in *obscurus* or *opisthomelas*.

This species may be always recognized among its congeners by the following combination of characters: its peculiar dimensions (see above), joined to the very dark upper parts, this color descending far on the sides of the head and breast, leaving a conspicuously white under eyelid; the almost entirely white under tail coverts and the comparative shortness and characteristic degree of roundness of the tail.

This is so very distinct, and at the same time so well known a species, that it hardly requires comparison with any other. The features in which the *P. yelcuanus* differs from it will be pointed out under the head of the latter.

PUFFINUS YELCUANUS, Bp. ex Acerb.

Procellaria yelkouan,* Acerbi, "Bibliot. Ital., 1827, exl., Agost. p. 294;" et "Bull. des Sciences Nat., 1829, xvi. p. 463. Schlegel, Monog. Proc. Mus. Pays-Bas, 1863, p. 29. *Puffinus yelkouan*, Bonaparte, Comptes Rend. Tab. Longip. , Id. Consp. Av. ii. 1856, p. 205.

Habitat.—More eastern portions of the Mediterranean Sea; especially in the Black Sea, and in the vicinity of the Bosphorus.

With this species, admitted by the majority of modern authors, I am acquainted only through descriptions. This is specially to be regretted, since authors are at variance regarding its characters and affinities, and are not even entirely agreed upon its specific validity. Bonaparte considers it to be the representative of *obscurus* in the Black Sea and vicinity, and says that it is smaller than that species (being only 10 inches in length) and has a slenderer bill. Dr. Schlegel, on the contrary, considers it as most intimately allied to *anglorum*, which it replaces in that locality. As far as I can judge from a careful study of published descriptions, I entirely agree with Dr. Schlegel in opinion. On comparing it with *anglorum*, Dr. Schlegel has found it to differ as follows: In the greater elongation of the point of the wing; in the color of the upper parts being lighter and rather tending to grey than black, as is also the color of the dark feathers of the crissum; and in the uniform deep gray of the lateral under tail coverts, these latter being, in *anglorum*, black on their outer, and white on their inner webs.

The following detailed measurements are given by the same author, taken from individuals coming from the Bosphorus, near Constantinople. They are to be compared with those of *anglorum*, already given on a previous page. Wing (from the carpus), 8.33 to 8.66 inches and hundredths. Tail, 2.40 to 2.60. Bill along culmen, 1.20 to 1.50; height, .28 to .33; width, .40. Nasal tubes, .16 to .20. Tarsus, 1.66 to 1.80; middle toe, 1.58.

PUFFINUS OBSCURUS, Vieill. ex Gmel.

Procellaria obscura, Gmel., Syst. Nat., i. pars ii. 1788, p. 559. Lath., Ind. Ornith., ii. 1790, p. 828, et auct. antiq. Vieillot, Nouv. Dict. H. N. 1817, xxv. p. 423. *Puffinus obscurus*, Bonap., Synop., 1828, p. 371. Vieillot, Gal. Ois., 1834, ii. p. 230, pl. 292. Audub., Bds. Amer., 1844, vii. p. 216, pl. 458. et al. auct. recent. *Nectris obscura*, Kuhl, Beiträge Zool., 1820, p. 147, pl. xi. fig. 11. *Cymotomus obscurus*, Macgillivray, Man. Orn., 1844, ii. p. 13. "*Puffinus l'herminieri*, Lesson," fide Bp. *Puffinus floridanus*, Musæi Beroliensis," fide Bp.

Habitat.—The warmer portions of the Atlantic Ocean, especially the Gulf of Mexico, and the coasts of the Southern United States; abundant in the Bahamas and Bermudas. Wanders as far north as New Jersey, and is accidentally found in Europe. Apparently replaced in the corresponding latitudes of the Pacific Ocean by my *Puffinus opisthomelas*.

For so long known a species, the present has remarkably few synonyms,

* I find this barbarous name variously spelled yelkouan, yelkuan, yelkoan, etc. I have seen fit to modify it inasmuch that it may present somewhat of a classical aspect.

and its bibliography is as explicit as that of almost any of the eighteenth century species of the family. First indicated with tolerable accuracy in Linnæan times, the species has almost invariably been presented under its original and proper specific title, though referred successively to the genera *Puffinus*, *Nectris*, and *Cymotomus*. The names "*l'herminieri*" of Lesson, and "*floridanus*" of the Berlin Museum, which I quote upon the authority of Bonaparte, are the only specific synonyms which I have met with.

There is an unusual and remarkable discrepancy in the statements of various authors concerning the length of the species, different writers giving the dimension from as little as $9\frac{3}{4}$ inches to over 13. It is impossible that it should vary to this extent. I believe the average length is a little over eleven inches.

Audubon's description of this species is sufficiently pertinent, but the plate he gives is unusually poor, and by no means true to nature. The outline of the bill is exceedingly faulty; the line of demarcation of the dark and light colors along the side of the head and neck is by no means accurate, and the lower tail coverts are represented as entirely white. The exact insertion of the right tibia of the individual figured has always been to me, anatomically speaking, a puzzle.

Dr. Kuhl informs us, in the text, that figure 11 of plate ix. of his *Monographie der Procellarien* was intended as a representation of the bill of this species; which is fortunate, as otherwise it would be quite impossible so to identify it.

I am much surprised at the statement by Dr. Degland, (*Ornithologie Européenne*, ii. page 366, published in 1849!) that "*cette espèce est peu connue, et il n'est pas certain qu'elle est distincte de la précédente*"—*P. anglorum*! This author's indication of the habitat of this species is vague, and leaves much to be desired.

M. Temminck (*Man. Ornith.*, ii. p. 808) gives, under head of *P. obscurus*, an excellent description of this species, except that the dimensions are inaccurate, being far too small.* The exact measurements of both of Temminck's typical examples are given by Dr. Schlegel in his recent monograph of the *Procellariæ*, (*Mus. Pays-Bas*, p. 30.) This author finds that one of the types is an example of *anglorum*, from the Mediterranean Sea, afterwards labelled by Temminck himself a *P. Baroli*, Bonelli; and that the other is a small, weak-billed specimen of the true *obscurus*, from the Atlantic Ocean. These facts, supported by the authority of one so well known for diagnostic acumen as Dr. Schlegel, are indicative of an imperfect acquaintance on the part of Temminck with the species he treats of under the name *obscurus*.

The species of *Puffinus* spoken of in a paper published by Dr. D. W. Prentiss and myself in the *Annual Smithsonian Report* for 1861, (p. 418), as having occurred at Washington, D. C., and doubtfully referred to as the *obscurus*, has since been definitely ascertained to be this species.

Description.—Form: The bill is rather small and weak, and considerably compressed, except just at the base. In length along the culmen it measures just about two-thirds the skull, and about three-fourths the tarsus. It is quite stout at the base, where the height very decidedly surpasses the width. The unguis rises rapidly and a little suddenly above the rest of the culmen, and is strongly convex in outline. The commissure, from the insertion of the feathers to the unguis, as well as the outline of the lower mandible as far as the unguis, is almost perfectly straight. The nasal tubes are short, being much less than a fourth the length of the culmen, but they are elevated and quite conspicuous, much more so than in *anglorum*. The wings barely reach, when folded, to the end of the long tail. The proportionate lengths of the primaries are the same as in most other species. The tarsus is just as long as the middle toe without its claw. The outer toe with its claw is just as long as the middle one with its claw. The top of the inner claw about reaches the

* "Longueur, "à peupres 10 pouces."

base of the middle. The tail is very long, exceeding that of *anglorum*, which is a much larger species. It is also so very much graduated as to be almost cuneate, the lateral feathers being relatively shorter than in any other species. The under tail coverts are very long, fully equalling the central rectrices.

Color.—The upper parts are of a hue quite different from that of *anglorum*, the black having every where a quite appreciable grayish or plumbeous tinge, and the borders of the feathers being still notably lighter, especially on the scapulars and tertials. The color is deepest on the rump and upper tail coverts; it is much restricted on the sides of the head and neck, not extending below the level of the eyes, and even there its borders are marbled with white. On the sides of the breast the dark color extends considerably more towards the median line, but it is of a very light plumbeous tint, and much variegated with white. Both eyelids are more or less white, and there is, moreover, an indication of a white superciliary streak. The remiges and rectrices are colored, as in *anglorum*. The under parts, from the chin to the under tail coverts, are white, as are the axillary feathers and inferior alar tectrices, the white only interfered with over the flanks by leaden black. The longest posterior under tail coverts are brownish black, as are also one or two rows of the exterior ones, the rest being white, with or without a plumbeous tint. Notice that in amount of white on the under tail coverts, *obscurus* is just intermediate between *anglorum* and my new *opisthomelas*. The bill is deep leaden blue, darker at the apex; the legs and feet colored, as in *anglorum*.

Dimensions.—Length of bill along culmen, 1.25; along rictus, 1.70; from end of nostrils to tip, .90; from feathers on side of lower mandible to its apex, 1.20; its depth at base, .40; width, .35; depth at convexity of unguis, .25. Wing, from the carpal joint, 8.00. Tarsus, 1.60; middle toe and claw, 1.80; outer do., 1.85. Central tail feathers, 4.25; exterior feathers nearly an inch shorter. Total length from tip of bill to end of tail about 11.00; expanse of wings about 25.50.

Variations.—I find the differences in size to be about the same, relatively to its dimensions, as in the other smaller *Puffini*, while, as usual, the general form and the proportion of parts are pretty constantly preserved. The characteristic hue of the upper parts is always recognizable, but the precise tint varies with the age of the feathers. The margins of the dorsal feathers are frequently very conspicuously lighter. The limit of the extent of the dark color on the sides of the head, neck, and breast, hardly differs notably, even with age, and is a strong specific character. The relative amount of the black and white on the under tail coverts is also pretty constant, being intermediate between *anglorum* and *opisthomelas*, as before stated. The unusual graduation of the tail is, I believe, always preserved in mature birds.

The combination in this species of its small size, the tint of the upper parts, and its characteristic line of demarcation with the white on the sides of the head, neck, and breast, together with the color of the under tail coverts, and the length and shape of the tail, renders it readily diagnosticable. As with *anglorum*, I have taken it as the standard in treating of the other closely allied; and the peculiar points wherein each differs from it will be found detailed under their respective headings.

PUFFINUS OPISTHOMELAS COUES, nov. sp.

Diag.—*P. Puffino obscurus* nec perdissimilis; sed major, rostro longiore, robustiore, alis pedibusque longioribus, caudâ brevior, minus rotundata; et tectricibus caudæ inferioribus ferè omnino fuliginoso-nigris.

Habitat.—South Pacific coast of North America.

Description.—Form: The bill is rather long, about four-fifths the tarsus, stout, moderately compressed, a very little higher than broad at the base, the unguis large and strong, its convexity great, and rising much above the level of the rest of the culmen, the depth of the bill at the point of the greatest

1864.]

convexity of the unguis being much more than in its middle. The outline of the inferior mandibular rami is about straight as far as the unguis; the line of the commissure is considerably curved. The nasal tubes are large and prominent, and rather long for this group, being more than a fourth of the culmen; and the nasal apertures are much elongated, being very elliptical rather than circular. The frontal feathers extend forwards to a point on the median line instead of being the segment of a perfect circle, as in *anglorum* and *obscurus*. The folded wings reach beyond the tail. The tail is comparatively and absolutely much shorter than in *obscurus* and very decidedly less rounded, the difference between the middle and exterior rectrices being only about half an inch. The feet are as much longer than those of *obscurus* as is proportional to the greater size of the bird; the tarsus is as long as the middle toe and half its claw. The outer toe and claw equals the middle; the tip of the inner claw falls short of the base of the middle one.

Color.—The nasal tubes and culmen are blackish, the sides of the bill yellowish or reddish brown, the unguis mostly light bluish white. "The iris is dark brown," (collector's label.) The internal aspect, and part of the outer side of the tarsus, the middle and inner toes and the webs are light yellowish flesh color. The rest of the tarsus, the outer toe and the very margins of the webs are brownish black. The claws are brown. The entire upper parts, the wings and tail are of exactly the same shade of sooty black as obtains in *obscurus*, but with the following notable difference in the line of demarcation of the white on the sides of the head, neck and breast: the dark color is much more extensive, reaching as far below the eyes as it does in *anglorum*, and there is no definite union of the two colors; but as the dark takes on more and more of a lighter plumbeous hue, it insensibly becomes more and more nebulated with white. There is no white on either eyelid, nor any indication of a white superciliary line. The under wing coverts are white, as in *obscurus*; the bend of the wing rather more decidedly mottled with the color of the back. The axillary feathers are more or less blackish towards their ends instead of being pure white. The flanks are more extensively and decidedly fuliginous black than in *obscurus*. It is in the color of the under tail coverts, however, that the difference from *obscurus* is most apparent. These feathers are entirely of a deep fuliginous black, except a few of the shortest ones just posterior to the fundament, which are whitish.

Dimensions.—Bill along culmen 1.40, along commissure 2.00, from end of nasal tubes to tip 1.05, from feathers on side of lower mandible to its tip 1.40; height at base .42, width a little less; height at convexity of unguis .32. Wing from the carpus about 9.00. Tarsus 1.80; middle toe and claw 2.10. Tail 3.75; outer feathers .60 shorter; (in *obscurus* tail 4.25; outer feathers nearly 1.00 shorter.)

Variations.—With but two specimens before me, I cannot speak so fully on this point as I could wish; but the variations are doubtless quite parallel in all respects with those of *anglorum* or *obscurus*. The above measurements indicate the average of the two specimens. They are precisely similar in colors.

Comparison with allied species.—This new species differs from *obscurus* as follows, briefly: In its larger size, as will be palpable from the measurements given of the bill, wings and feet.* In its both relatively and absolutely shorter tail, which is also much less rounded. In the different outline of the frontal feathers on the bill. In the different coloration, inasmuch that there is no white about the eye; that the dark color extends much further on the sides of the head and neck; and that the under tail coverts are almost entirely fuliginous black, instead of being for the most part white.

It is distinguishable at a glance from *anglorum* by its greatly inferior size,—

* The collector's label gives, "Total length 15 inches; expanse of wing 32;" but these cannot be implicitly relied on.

vide measurements; by the very different color of the upper parts; and by the fuliginous black instead of white under tail coverts.

The *Puffinus yelcuanus* is lighter colored above than is *anglorum*, and therefore this species approaches it in this respect. But *yelcuanus* is much larger than the present species, and has white under tail coverts like *anglorum*; so that it is impossible to confound it with *opisthomelas*.

Still more different is this species from the *P. nugax*, Solander, from the Australian seas. This latter is a very diminutive species, much smaller even than *obscurus*, the wing being only about $6\frac{1}{2}$ inches from the carpus. It also has the white of the throat extending far up on the sides of the head and neck, and white under tail coverts; characters diametrically opposed to those which obtain in the present species.

I am acquainted with no other species to which the present bears any sort of resemblance. I trust that I have so fully and correctly indicated its characters and relationships, that its introduction, even into this peculiarly intricate group, will be the cause of no confusion or uncertainty regarding it.

Two fine examples are contained in the Smithsonian Museum, both collected by Mr. John Xantus at Cape St. Lucas, Lower California. (Smiths. Catalogue, Nos. 16,990, 16,991.)

PUFFINUS NUGAX (Solander.)

Procellaria nugax, Solander, Schlegel, Mon. Proc. Mus. Pays-Bas, 1863, p. 31. *Puffinus nugax*, Bonaparte, Consp. Av., ii. 1856, p. 205.

Puffinus assimilis, Gould, P. Z. S., 1837, v. p. 156. Id. Ann. et Mag. N. H. xvi. Id. Birds Aust., vii. pl. 56.

"*Procellaria australis*, Eyton," (Bp.)

Habitat.—Australian seas.

A fine suite of this well-marked species is in the collection of the Philadelphia Academy. Its relationships are closest with *P. obscurus*, but the differences are sufficiently obvious on comparison. It is the very smallest known species of *Puffinus*, being appreciably less than the *obscurus*. It is hardly 10.50 inches in length; the wings from the carpus only about $6\frac{1}{2}$; the tail averages 2.75; the bill about one inch; the tarsus $1\frac{1}{4}$; the middle toe about the same. The color of the upper parts is about the same as in *P. obscurus*, or a very little lighter; the feathers generally with appreciably darker tips. A striking diagnostic feature is found in the extent to which the white of the under parts mounts up on the sides of the head and neck, which is greater than in any other species. The inferior caudal tectrices are usually entirely pure white. The under surfaces of the wings are pure white, and the inferior aspect of the inner webs of the primaries are dull whitish, being much lighter than are these parts in *obscurus*. The bill is dusky horn color. The tarsi are greenish yellow; the webs bright chrome yellow.

The preceding paragraph shows the points in which the species differs from *obscurus*. It is too distinct from *anglorum* or *yelcuanus* to require comparison. It cannot be confounded with my *P. opisthomelas*, since the latter is nearly as much larger than *obscurus* as *nugax* is smaller; has the coloration of the sides of the head and neck very different, (compare descriptions;) has black instead of white under tail coverts, etc.

I have not an opportunity of examining the original description of *nugax* by Solander, but all authors agree that it is the species subsequently named *assimilis* by Gould. I do not know where the species is called *australis* by Eyton, but quote the name on the authority of Bonaparte.

Analytical Synopsis of the Genera and Species of PUFFINÆ.

Family PROCELLARIDÆ.

Subfamily PROCELLARINÆ.

Section PUFFINÆ.

Char.—Tail of twelve much graduated feathers. Bill long, compressed, 1864.]

much hooked, the outline of the unguis of the lower mandible concave, decurved. Nasal tubes short, broad, flattened, apically usually very obliquely truncated; in length usually a fourth of culmen; the internasal septum broad. In color either entirely fuliginous, or cinereous, or brown above and white beneath; never glaucous or bluish, or with parti-colored primaries. "Shearwaters."

I. MAJAEQUEUS Reich.

The very short tail only a fifth of the total length. Bill unusually stout for this section; nasal tubes approaching in character those of Fulmareæ. Very large; fuliginous, with peculiar facial markings.

1. M. ÆQUINOCTIALIS Reich.

Pr. æquin. L. *Puffinus æquin.* Homb. et Jacq. *Pr. nigra*, Forst. *Puff. capit's bonæ-spei*, Briss.

Tarsus $2\frac{1}{2}$ inches; unguis of bill yellow; a submental white spot.

2. M. CONSPICILLATUS Bp.

Proc. conspicillatus, Gould. *Pr. larvata*, Less.

Larger; bill more robust; its unguis bluish black; tarsus $2\frac{1}{3}$; usually a white submental spot; a lateral stripe on sides of head, and a transverse one across the vertex before the eyes.

II. ADAMASTOR Bp.

Bill and nasal tubes identical with those of *Majaqueus*. Tarsus much less than middle toe without claw. Tail very short, much graduated. Bi-color; above cinereous, below white.

3. A. CINEREUS Coues.

Proc. cinerea, Gm. (non Cuv., Kuhl., Temm., Schleg., Degl., Schinz., Keys. et Blas. quæ *Puff. Kuhlîi*, Boie; nec Aud., Mitt. quæ *Puff. major*, Fab.) *Puff. cinereus*, Lawrence, 1858. *Adamastor cinereus*, Coues, 1864. *Proc. hesitata*, Forst., Gould, Reich. (non Kuhl., Temm., Newton, quæ *Astrelata diabolica*) = *Puffinus hesitata*, Lawr., 1853. *Puff. Kuhlîi*, Cass. [1862] nec Boie. *Proc. adamastor*, Schleg. *Adam. typus*, Bp.

Bill yellow, nasal tubes, culmen and sulcus on lower mandible black; above with under surface of wings and tail cinereous; below white; 19 inches long; bill 1.80, wing 13.00, tail 5.75, tarsus 2.40, middle toe and claw 2.90.

4. A. GELIDUS Coues.

Proc. gelida, Gm., Lath., Vieill. *Proc. flavirostris*, Gould. *Adamastor flavir*, Bp.

Above brown, with paler edges to the feathers; wings and tail deep blackish brown; below, including the under surfaces of wing and tail, white, the feathers of the former with a brown longitudinal streak; bill yellow, its tip dark; 19 inches long, wing 15, tail 6.50, middle toe and claw 3.15.

5. A. SERICEUS Bp.

Puff. sericeus, Lesson.

Bill black; above grayish ash, deeper on the wing coverts; below white; 15 inches long, wing 11.50, tail 5, tarsus 1.75, middle toe 1.33.

III. THIELLUS Gloger.

Generally like *Nectris*, but tail unusually long and cuneiform, being nearly or quite half as long as the wing from the carpus.

6. T. SPHENURUS Bp.

Bill flesh color, tinged with brown, darker on culmen and unguis. Length 15 to 16 inches, wings about 11, bill 1.60.

7. T. CHLORORHYNCHUS Bp.

Bill greenish orange, black on culmen and at tip. Bill 1.85; stouter than in *sphenurus*, a little larger than that species, but the wing usually shorter, ($\frac{1}{2}$ inch or more.)

[April,

IV. NECTRIS Bp. (emend. Forst.)

Size moderate; unicolor, fuliginous; feet pale; bill long, slender, much hooked; nasal tubes short, flat, very obliquely truncated; tail long, rounded; tarsus about equal to middle toe without claw, (vix nisi colore fuliginoso genere *Puffino* differre videtur!)

8. N. FULIGINOSUS Keys. et Blas.

Puff. fuliginosus, Strickl. et auct. (sed non *Proc. fuliginosus*, Gm., Lath., Vieill., quæ species "*Thalassio*;" nec Banks, [tab. 19;] nec Kuhl, [sp. 12] quæ *Pterodroma atlantica*, Gould.) *Puffinus major* fœm! Temm. *Puff. cinereus* fœm! Gould.

Bill concolor with plumage; feet brownish black; internal face of tarsus and the webs dusky yellowish. Length 18 inches, wing 12, bill 2.00. North Atlantic.

9. N. AMAUROSOMA Coues, nov. sp.

Bill concolor with plumage; feet fleshy white, outer side of tarsus and outer toe tinged with dusky; inferior wing coverts mostly white; wing 11 inches, tail 4.25, bill 1.70. Pacific coast of N. Amer.

10. N. CARNEIPES Bp.

Puff. carneipes, Gould. *Proc. carneipes*, Schlegel. *Majaqueus carneipes*, Reich. "*Puff. cinereus*, juv. Smith." "*Nectris gama*, Bp."

Bill fleshy white, culmen and tips dusky; legs, feet and membranes yellowish flesh color. Length 15 inches; length of bill, feet, wings, tail, much the same as *fuliginosus*. Australian seas.

11. N. TENUIROSTRIS Bp.

Proc. tenuirostris, Temm. *Puff. tenuirostris*, Temm. et Schleg. "*P. curilicus*, *P. tristis*, Musæorum."

Very small; bill excessively weak and slender; wing 10 inches, tail 3.50, bill 1.20, tarsus 1.90. Bill dusky greenish yellow; feet yellowish; posterior edge of tarsus and under surface of webs blackish. White under wings as in *amaurosoma*. Japan.

12. N. BREVICAUDUS Bp.

Puff. brevicaudus, Brandt. *Majaqueus brevicaudus*, Reich.

"Blackish fuliginous, lighter beneath; bill black, yellowish at base; feet cinereous, webs yellow." (Bp.) "Australian seas." Gould, [species mihi ignota.]

V. PUFFINUS Briss.

Moderate and small in size, bicolor, above brown or cinereus, below white. Wings very long and pointed; tail long, rounded. Feet very large; tarsus shorter than middle toe and claw; bill long, rather slender, compressed, hooked; nasal tubes short, flat, obliquely truncated; nasal septum broad, nostrils oval.

13. P. KUHLL Boie.

Proc. puffinus, Temm., Vieill. [1828]; et al, auct. Europ.; sed non Linn., quæ *P. anglorum*, Ray. *Proc. sive Puff. cinereus*, Cuv., Temm., Kuhl., Schleg., Degl. et al. auct. Europ. ferè omnium; sed non Gm., Lath., Vieill., Lawr. quæ *Adamastor cinereus*, Mihi; nec Aububon et auct. Amer. quæ *P. major*, Fab.

Bill yellow, its nasal tubes more elevated, compressed and vertically truncated than usual in this genus. Above light brownish ash or cinereous, each feather with a lighter margin, nebulated and undulated with pure white on sides of head and neck; posterior upper tail coverts and whole under parts, including under surfaces of wings and all the under tail coverts, pure white. Tail almost cuneiform; feet weak and slender, yellowish; outer toe and claw longer than middle do. North Atlantic Ocean only.

1864.]

14. *P. LEUCOMELAS* Bp.*Proc. leucomelas*, Temm.

Smaller than *P. Kuhlî*; weaker bill. Feathers of the upper parts and sides of head and neck grayish white, each with a longitudinal shaft line of brown.

15. *P. CREATOPUS* Cooper, n. sp. [in epistolis.]

With the general aspect of *P. major*. Bill short, usually swollen and stout at the base, nasal tubes elevated, turgid, short. Bill yellowish flesh color. Nasal tubes, culmen and tip blackish. Feet light flesh color! Upper parts generally as in *P. major*, but no white on upper tail coverts; no white at bases of primaries; the color of sides of head extending round on the throat, with no dividing line; and the under tail coverts entirely fuliginous black. Bill along culmen 1·60; height at base ·60.

16. *P. MAJOR* Fab.

Proc. puffinus, Kuhl, et auct. al. aliq. Europ. (sed non Linn., Gm., Lath. quæ *P. anglorum*, Ray; nec Temm. quæ *Kuhlî*, Boie.) *Puff.* sive *Proc. major*, Auct. *Ardenna major*, Reich. *Puff. cinereus*, Bp. [1828,] Audub., Nutt. non Gm.

Above smokey brown, the feathers with lighter edges. Posterior upper tail coverts mostly white. A definite line of demarcation between the brown and white on the sides of the head and neck. Length 18 to 20 inches; bill 2, wing 13, tarsus 2·40.

17. *P. ANGLORUM* Temm.

Proc. anglorum, Ray. *Puff. anglorum*, auct. *Proc. puffinus*, L., Gm. Lath., Brünn. sed non al. auct. quæ *P. major*. *Nectris puffinus*, Keys. et Blas. *P. arcticus*, Fab. *P. Baroli*, Bonelli.

Tarsus equal to middle toe without claw. Bill about two-thirds the tarsus, along culmen 1·40 inches; wing 9·25. Above very deep lustrous brownish black,—darker than in any other species.

18. *P. YELCUANUS* Bp.*Proc. yelkuan*, Acerbi.

From the Mediterranean Sea. Like *P. anglorum*, but lighter colored above, the point of the wing more elongated, and lateral under tail coverts uniformly deep grey.

19. *P. OBSCURUS* Vieill.

Proc. obscurus, Gm. *Proc.* sive *Puff. obscurus*, auct. *Nectris obscurus*, Kuhl. *Cymostomus obscurus*, Macgill. *Puff. l'herminieri*, Less. *P. floridanus*, Mus. Berol.

Bill three-fourths as long as the tarsus. Tail very long, much graduated. Above grayish, or plumbeous black, not extending on the sides of the head below the eyes. Axillary feathers white. Longest posterior under tail coverts brownish black, rest white. Bill 1·25, wing 8, tail 4·25, exterior rectrices an inch shorter. Tarsus 1·60; middle toe and claw 1·80— inches and hundredths.

20. *P. OPISTHOMELAS* Coues, nov. sp.

From Cape St. Lucas. Generally like *P. obscurus*, but larger, with a longer bill and wings, a shorter, less graduated tail; almost all the under tail coverts and axillary feathers fuliginous black, and a different line of demarcation between the color of the upper and under parts on the sides of the head and neck. Bill 1·40, wing 9, tarsus 1·80, middle toe and claw 2·10, tail 3·75, outer rectrices only ·60 hundredths of an inch shorter.

21. *P. NUGAX* Bp.*Proc. nugax*, Solander. *Puff. assimilis*, Gould. "*Proc. australis*, Eyton."

From the Australian seas. Smallest of all; wing only $6\frac{1}{2}$ inches, tail $2\frac{3}{4}$, bill one inch, tarsus $1\frac{1}{4}$. The white of the under parts mounts high up on the sides of the head. Under tail coverts entirely white. Under surfaces of inner webs of primaries dull whitish.

[April,